ONTARIO

DEPARTMENT OF EDUCATION

Suggestions

for the

LAYOUT AND CONSTRUCTION OF SCHOOLS IN ONTARIO

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ONTARIO

DEPARTMENT OF EDUCATION

FOREWORD

This draft has been prepared to meet the requests of architects and school administrators for condensed information. The contents are intended as a guide and are not to be considered as official.

The extensive work of the Committee on Planning, Construction and Equipment of Schools in Ontario is most gratefully acknowledged. Practically all of their recommendations have been included in this guide.

Criticisms are invited. Such criticisms will be considered in conjunction with the recommendations of the Royal Commission on Education.

No attempt has been made to set up building codes. It is felt that architectural and engineering services together with Dominion, Provincial and Municipal Codes and Regulations are a sufficient guarantee to ensure safe and proper buildings.

The suggestions contained are by no means complete. It is hoped that as additions and refinements are found necessary, comprehensive information will be made available.

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1. PROCEDURE FOR THE ESTABLISHMENT OF RURAL PUBLIC SCHOOL ACCOMMODATION

The procedure for the establishment of a new rural school building or additions or alterations to an existing school must comply with the requirements of the "Public Schools Act." The following brief outline may serve as a guide.

If a new site or additions to the present site are necessary:-

a. The Board selects the site which should meet with the approval of the Public School Inspector.

b. The site selected must be considered at a special meeting of the ratepayers and if approved must be adopted.

c. If the ratepayers disapprove, the matter must be decided by arbitration.

d. The Public School Inspector furnishes the Department of Education with details for final approval for grant purposes.

e. When final approval is given and financing arranged, the Board may purchase the site.

f. Refer to Items 101 and 200 for "Selection of Site."

If a new building or additions or alterations to the present building are necessary:-

g. The Board should prepare a proposal, Item 5, which must meet with the approval of the Public School Inspector.

h. The proposal must be approved at a special meeting of the ratepayers. The ratepayers also approve the estimated amount of the debenture issue.

i. When the proposal has been approved by the ratepayers, it should be forwarded by the Public School Inspector to the Department of Education for tentative approval for grant purposes.

j. When tentative approval has been given by the Department of Education, the Board should request the council or councils to get assurance from the Ontario Municipal Board that favourable consideration will be given to the necessary debenture issue.

NOTE: The council or councils are obliged to take action as requested.

k. If assurances are given by the Ontario Municipal Board, the Board may retain architectural services, Item 7.

l. Sketch plans should be prepared, Item 11. These plans accompanied by an estimate should be submitted and approved by the Board and the Public School Inspector. The Inspector should submit these plans to the Department of Education in all cases of large construction projects.

NOTE: If the estimate is in excess of the amount in the proposal, it may be necessary to get re-approval from the ratepayers and further assurances from the Ontario Municipal Board.

PROCEDURE FOR THE ESTABLISHMENT OF RURAL PUBLIC SCHOOL ACCOMMODATION (Cont'd)

m. When the sketch plans are approved, final plans and specifications may be prepared, Item 12. These plans and specifications must be submitted to and approved by the Board and the Public School Inspector. The Inspector should submit these plans to the Department of Education in all cases of large construction projects.

n. When the final plans and specifications are approved, the Board may invite tenders.

o. When tenders are received, the Board makes recommendations to the Public School Inspector regarding the tender selected, the terms of contract, and the sum involved. If the lowest tender is not acceptable, reasons therefor should be submitted.

p. The Public School Inspector then makes recommendations to the Department of Education for final approval for grant purposes.

q. When final approval is given, the Board requests the council or councils to complete arrangements with the Ontario Municipal Board for the issue of the necessary debentures. These should include the building contract together with all other capital expense to complete the project.

NOTE: If the amount involved is in excess of that which was tentatively agreed to by the ratepayers and the Ontario Municipal Board, it may be necessary to call another special meeting of the ratepayers.

r. When financial arrangements are completed, the Board may let the contract and proceed with construction.

s. If the Board does not proceed within 12 months of the date of any given approval, it is advisable to apply for renewal of the approval concerned.

t. The Board may be required to incur expense for professional services, option on and survey of site or other items before debentures are issued. It is important that the annual estimates as submitted by the Board to the council or councils provide for such expense.

2. PROCEDURE FOR THE ESTABLISHMENT OF URBAN PUBLIC SCHOOL ACCOMMODATION

The procedure for the establishment of a new urban public school or additions or alterations to an existing school must comply with the requirements of "The Public Schools Act". The following brief outline may serve as a guide.

If a new site or additions to the present site are necessary:-

a. The Board selects the site which must meet with the approval of the Public School Inspector.

b. The Public School Inspector submits details regarding the size, location and cost of the site to the Department of Education for final approval for grant purposes.

PROCEDURE FOR THE ESTABLISHMENT OF URBAN PUBLIC SCHOOL ACCOMMODATION (Cont'd)

c. When final approval is given, the Board may purchase the site contingent upon satisfactory arrangements being made with the council or councils concerned and the Ontario Municipal Board for the necessary debenture issue.

d. Refer to Items 101 and 200 for "Selection of Site."

If a new building or additions or alterations to the present building are necessary:-

e. The Board should prepare a proposal, Item 5, which must meet with the approval of the Public School Inspector.

f. The proposal must be forwarded to the Department of Education by the Public School Inspector for tentative approval for grant purposes.

g. When tentative approval has been given by the Department of Education, the Board must get assurance from the council or councils concerned and from the Ontario Municipal Board that favourable consideration will be given to the issue of the estimated amount of debentures required.

NOTE: If the council or councils refuse to consider the issue of debentures, the Board may request the council or councils to call a vote of the ratepayers. In the event of a favourable vote, the council is obliged to make representations to the Ontario Municipal Board for assurances that the necessary debentures may be issued.

h. If assurances regarding the debenture issue are given by the council and the Ontario Municipal Board, the Board may retain architectural services, Item 7.

i. Sketch plans, Item 11, should be prepared. These plans accompanied by an estimate must be submitted and approved by the Board and the Public School Inspector. The Inspector should submit the plans to the Department of Education in all cases of large construction projects.

NOTE: If the estimate is in excess of the amount in the proposal, it may be necessary to get further assurances from the council and the Ontario Municipal Board.

j. When the sketch plans and the estimate are approved, final plans and specifications, Item 12, may be prepared. These plans and specifications must be submitted to and approved by the Board and the Public School Inspector. The Inspector should submit these plans and specifications to the Department of Education in all cases of large construction projects.

k. When the final plans and specifications are approved, the Board may invite tenders.

l. When the tenders are received, the Board makes recommendations to the Public School Inspector regarding the tender selected, the terms of the contract, and the sum involved. If the lowest tender is not acceptable, reasons therefor should be submitted.

PROCEDURE FOR THE ESTABLISHMENT OF URBAN PUBLIC SCHOOL ACCOMMODATION (Cont'd)

m. The Public School Inspector then makes recommendations to the Department of Education for final approval.

n. When final approval is given, the Board requests the council or councils to complete arrangements with the Ontario Municipal Board for the issue of the necessary debentures. These should include the building contract together with all other capital expense to complete the project.

NOTE: If the amount involved is in excess of the amount which was tentatively agreed to by the council or councils and the Ontario Municipal Board, it may be necessary to call another vote of the ratepayers.

o. When financial arrangements are completed, the Board may let the contract and proceed with construction.

p. If the Board does not proceed within 12 months of the date of any given approval, it will be necessary to apply for renewal of the approval concerned.

q. The Board may be required to incur expense for professional services, option on and survey of site or other items before debentures are issued. It is important that provision should be made for such items and that the council or councils be notified and agree to such commitments before they are made.

3. PROCEDURE FOR THE ESTABLISHMENT OF RURAL AND URBAN SEPARATE SCHOOLS

The procedure for the establishment of a new separate school building, or additions or alterations to an existing school, must comply with the requirements of "The Separate Schools Act." The following brief outline may serve as a guide.

If a new site or additions to the present site are necessary:-

a. The Board selects the site, which must meet with the approval of the Separate School Inspector.

b. Application must be made to the Department, through the inspector, for tentative approval of the expenditure.

c. When tentative approval is received, the site selected must be considered at a special meeting of the separate school supporters and a resolution passed for its approval or otherwise. This applies only in the case of a rural school.

d. If the rural separate school supporters disapprove, the site must be decided by arbitration.

e. The separate school inspector must furnish the Department of Education with details for final approval for grant purposes.

f. When final approval is given and financing arranged, the Board may purchase the site.

g. Refer to Items 101 and 200 for "Selection of Site."

If a new building or additions or alterations to the present building are necessary:-

h. The Board should prepare a proposal, Item 5, which should meet with the approval of the Separate School Inspector.

PROCEDURE FOR THE ESTABLISHMENT OF RURAL AND URBAN SEPARATE SCHOOLS (Cont'd)

i. The proposal must be approved at a special meeting of the Separate School supporters in the case of a rural school. The supporters of a rural school may also approve the estimated amount of money and the method of financing to complete the project.

j. The proposal must then be forwarded by the Separate School Inspector to the Department of Education for tentative approval of the expenditure for grant purposes.

k. When tentative approval has been given by the Department of Education, the Board should get assurance from the proposed loaning agency that favourable consideration will be given to the necessary amount and method of financing.

l. If satisfactory financing is assured, the Board may retain architectural service, Item 7.

m. Sketch plans should be prepared, Item 11. These plans accompanied by an estimate must be submitted to and approved by the Board and the Separate School Inspector. The Inspector must submit these plans to the Department of Education in all cases of large construction projects.

NOTE: If the estimate is in excess of the amount in the proposal, it may be necessary to get re-approval from the supporters and further assurances from the loaning agency.

n. When sketch plans are approved, final plans and specifications may be prepared, Item 12. These plans and specifications must be submitted to and approved by the Board and the Separate School Inspector. The Inspector must submit these plans and specifications to the Department of Education in all cases of large construction projects.

o. When the final plans and specifications are approved, the Board may invite tenders.

p. When tenders are received, the Board makes recommendations to the Separate School Inspector regarding the tender selected, the terms of the contract and the sum involved. If the lowest tender is not acceptable, reasons therefor should be submitted.

q. Arrangements should be completed for financing the complete project. These include the building contract together with all other capital expense. The Board is required to pass a by-law authorizing the amount and terms of repayment of the necessary debentures or loan.

r. The tender selected together with a copy of the by-law with an attached schedule of the annual repayments of principal and interest must be submitted by the Separate School Inspector to the Department of Education for final approval for grant purposes.

s. When final approval is given by the Department of Education the Board must comply with the requirements regarding publication of the by-law.

PROCEDURE FOR THE ESTABLISHMENT OF RURAL AND URBAN SEPARATE SCHOOLS (Cont'd)

t. The Board may then let the contract and proceed with construction.

u. If the Board does not proceed within 12 months of the date of any given approval, it is advisable to apply for renewal of the approval concerned.

v. The Board may be required to incur expense for professional service, option on and survey of site, or other items before the loan or debentures are issued. It is important that provision be made to meet such expense.

4. PROCEDURE FOR THE ESTABLISHMENT OF SECONDARY SCHOOL ACCOMMODATION

The procedure for the establishment of a new secondary school building or additions or alterations to an existing school must comply with the requirements of the "High Schools Act." In the case of Vocational schools or Vocational Departments, the requirements of the "Vocational Education Act" must be observed. The following brief outline may serve as a guide.

If a new site or additions to the present site are necessary:-

a. The Board selects the site.

b. The Secretary of the Board submits details of the site selected to the Department of Education for approval. The size, shape, location, cost and all other significant information should be given.

c. The approval when issued is forwarded to the Secretary of the Board.

d. When approval is given, the Board may purchase the site contingent upon satisfactory arrangements being made with the council or councils concerned and the Ontario Municipal Board for the necessary debenture issue.

e. Refer to Item 101 and 300 for "Selection of Site."

If a new building or additions or alterations to the present building are necessary:-

f. The Board should prepare a proposal, Item 5.

NOTE: In the case of Vocational schools, the Advisory Committee and the Principal should make a survey of trade and industry in the district to discover the type of instruction required.

g. The proposal should be forwarded to the Department of Education by the Secretary of the Board for tentative approval.

h. When tentative approval has been given by the Department of Education, the Board must get assurance from the council or councils concerned and from the Ontario Municipal Board that favourable consideration will be given to the estimated amount of debentures required.

PROCEDURE FOR THE ESTABLISHMENT OF SECONDARY SCHOOL ACCOMMODATION (Cont'd)

h. NOTE: If the council or councils refuse to consider the issue of debentures, the Board may request the council or councils to call a vote of the ratepayers. In the event of a favourable vote, the council is obliged to make representations to the Ontario Municipal Board for assurance that the necessary debentures may be issued.

i. If assurances regarding the debenture issue are given by the council or councils and the Ontario Municipal Board then the Board may retain architectural services, Item 7.

j. Sketch plans, Item 11, should be prepared. These plans accompanied by an estimate should be submitted to and approved by the Board. The sketch plans and estimate should then be forwarded to the Department of Education for approval.

NOTE: If the estimate is in excess of the amount in the proposal, it may be necessary to get further assurances from the council or councils and the Ontario Municipal Board.

k. When the sketch plans and the estimate are approved, final plans and specifications, Item 12, should be prepared. These plans and specifications must be approved by the Board and then forwarded to the Department of Education for approval.

l. When the final plans and specifications are approved, the Board may invite tenders.

m. When the tenders are received, the Board makes recommendations to the Department of Education regarding the tender selected, the terms of the Contract and the sum involved for final approval. If the lowest tender is not acceptable, reasons therefor should be given.

n. When final approval is given, the Board requests the council or councils to complete arrangements with the Ontario Municipal Board for the issue of the necessary debentures. These should include the building contract together with all other capital expense to complete the project.

NOTE: If the amount is in excess of the amount which was tentatively agreed to by the council or councils and the Ontario Municipal Board, it may be necessary to call another vote of the ratepayers.

o. When financial arrangements are completed, the Board may let the contract and proceed with construction.

p. If the Board does not proceed within 12 months of the date of any given approval, it is advisable to apply for renewal of the approval concerned.

q. The Board may be required to incur expense for professional services, option on and survey of site or other items before debentures are issued. It is important that provision should be made for such items and that the council or councils be notified and agree to such commitments before they are made.

5. PROPOSAL

Before any commitments are made upon which the Department of Education is expected to pay grants, the Board must submit a proposal in writing to the Department, covering the following points.

a. STATISTICAL DATA

1. Present Enrolment..... pupils
2. Present Cost per pupil of average attendance $ .00
3. Expected enrolment within 5 years (Show basis of computation)..... pupils

b. ACCOMMODATION

1. Existing Space: List the number and kind of rooms and instructional areas whose use will be continued.
   Normal accommodation for..... pupils

2. Remodelled Space: List the number and kind of rooms and instructional areas to be remodelled.
   Normal accommodation lost or gained..... pupils

3. Abandoned Space: List the number and kind of rooms and instructional areas lost if old building, portable, or other temporary quarters are to be abandoned.
   Normal accommodation lost..... pupils

4. Additional Space: List the number and kind of new rooms, shops, laboratories, playrooms, assembly halls, art rooms, and other areas to be added.
   Normal accommodation gained..... pupils

TOTAL ACCOMMODATION..... pupils

NOTE: Refer to Item 201 for Elementary Schools
Refer to Item 301 for Secondary Schools

c. ESTIMATE (Elementary Schools Only) Refer to Item 15.

1. Site, including initial development (Item 101).... $ .00
2. Professional Fees (Item 7)..... $ .00
3. Instructional Areas (Item 202).... square feet
4. Auxiliary Areas (Item 203) allow an equal amount of space as in number 3 above..... square feet
5. Total Area..... square feet
6. Approximate Building Cost estimated at $10.00 per square foot..... $ .00
7. Furniture and Equipment (Item 204)..... $ .00
8. Approximate Total Cost Site, Fees, building and equipment..... $ .00

PROPOSAL (Cont'd)

d. ESTIMATE (Secondary Schools Only) Refer to Item 15.

1.	Site, including initial development (Item 101)....	$	.00
2.	Professional Fees (Item 7).....	$	.00
3.	Instructional Areas (Item 302) square feet		
4.	Auxiliary Areas (Item 303) allow 1½ times the amount as in number 3 above....._____ square feet		
5.	Total Area..... square feet		
6.	Approximate Building Cost estimated at $10.00 per square foot.....	$	.00
7.	Furniture and Equipment (Item 304).....	$	.00
8.	Approximate Total Cost Site, Fees, Building and Equipment.....	$	.00

6. THE SELECTION OF AN ARCHITECT

School design and construction is a highly specialized branch of architecture. Boards are strongly recommended to retain the services of an experienced school architect. The following suggestions are made which may assist Boards in choosing an architect.

a. Length of architect's experience in active architectural work.

b. Visits by Boards to schools built by architects and discussions with the Boards and school officials who use the schools.

c. The Department of Education does not make recommendations regarding the selection of an architect. This is the responsibility of the Board. Neither does the Department make comments on the plans submitted by an architect until he has been retained by the Board for the project concerned.

7. AGREEMENT BETWEEN THE BOARD AND THE ARCHITECT

Once a decision has been made, the Board should enter into an agreement with the architect selected for professional service. Full service including engineering and supervision is desirable.

Such service is expected to guarantee the best use of space together with a sound structure with well-engineered utilities for the efficient use and economical maintenance of the building.

Fees for such professional services (usually 6% of the building contract) are a legitimate charge against building costs and are, therefore, subject to grant. It should be noted, however, that any fees incurred before the proposal, Item 5, has been submitted and approved are not subject to grant.

The formal agreement is made on the "Standard Form of Agreement Between Client and Architect" or a short form which refers to the standard form may be used.

AGREEMENT BETWEEN THE BOARD AND THE ARCHITECT (Cont'd)

The scale of fees is set forth on the "Schedule of Professional Charges of the Ontario Association of Architects" which forms the basis of the agreement. There should be a clear understanding between the Board and the architect as to the extent of services and the amount of fees involved. Professional practice forbids architects to:

a. Submit drawings or models before their services have been retained and an agreement signed.

b. Enter into competition with one another unless the competition is conducted under the regulations of the Ontario Association of Architects.

c. Accept a commission where an agreement has been made with another architect until the first architect and the Board have made satisfactory mutual arrangements for the termination of the agreement.

8. EXTENT OF ARCHITECTURAL SERVICES

Complete architectural service should be retained. In general such service includes the following:

a. Assisting the Board in the selection of a site.

b. Advising the Board that the cost of building accommodation as required by the Board and approved by the Department is likely to be within the appropriation.

c. Preparing sketch plans to meet with the approval of the Board and the Department.

d. Preparing final working and detailed drawings and specifications to meet with the approval of the Board and the Department.

e. Providing any necessary professional engineering services.

f. Advising the Board on the calling of tenders.

g. Advising the Board on the awarding of the contract and making arrangements for bonding the contractor.

h. Supervising the construction of the building (architecturally and engineering.)

i. Certifying the payments due to the contractor.

j. Turning the completed building over to the Board.

Professional service includes other items to the point where the complete technical and business details of the entire building programme will be adequately accounted for without concern to the Board.

9. INFORMATION REQUIRED BY THE ARCHITECT

In order to render his best services, the architect requires the following assurances and information:

a. That the Board has written approval from the Department with respect to accommodation which is necessary.

b. That the Ontario Municipal Board is likely to give favourable consideration to the issue of debentures to cover the estimated cost.

c. That the Board has made arrangements with the Municipal Council for the payment of any necessary fees or expenses incurred prior to the need of issuing debentures.

d. Detailed information regarding the installation of built-in equipment and utilities such as gas, water, power, etc. (This is not a serious factor except in Vocational schools in which case it should be furnished by the Principal. In cases where the Principal has not been appointed, Departmental officials may be of some assistance.)

e. A survey and topographic map of the site. (The Board is obliged to retain and pay an Ontario Land Surveyor for this purpose and to furnish the information to the architect prior to the preparation of the sketch plans.)

10. EXTENT OF BUILDING CONTRACT

Depending upon the size and class of school, the building contract usually includes provision for the following items. (Further information may be obtained from the architect.)

a. Completed building.

b. Grading, aprons, parking areas, hard-surface playing areas, roadways and walks in the immediate vicinity of the building and to the street. (Landscaping and the development of playing fields and fencing are not generally included.)

c. All mechanical and electrical equipment in operating order including clocks, fixtures, alarm systems, etc.

d. Bicycle racks.

e. Flagpole.

f. Supply, connection, and payment of fees for the installation, testing and approval of all utilities. In the absence of a municipal water supply or sewage disposal system, an independent water supply and sewage disposal system should be included.

g. All built-in equipment including cupboards, cabinets, counters, lockers, mirrors, dispensers and general fire-fighting apparatus including extinguishers. Standard school furniture and equipment should be purchased directly by the Board. The building contract should provide for any necessary utilities and their connection to such standard furniture and equipment.

h. Keys and key cabinet.

i. Blinds, screens and storm sash, as necessary.

j. The protection of the work during progress of construction.

11. SKETCH PLANS

Sketch plans should be prepared in accordance with the proposal which has been approved by the Department.

The sketch plans should illustrate the accommodation and facilities as follows:

a. Site plan to scale showing the size, shape, general topographical conditions and points of compass. Location of the proposed building on the site, existing structures, possible future additions, playground areas. Adjacent streets, highways, sidewalks, drives, sewers, water, gas, and electric services.

b. Floor plans to scale, not less than 1/16" to the foot, showing location and purpose of all rooms, shops, corridors, stairs, washrooms, offices, boiler rooms, etc. These spaces should be numbered for reference purposes.

c. Location of doors, windows, plumbing fixtures, built-in equipment, chalkboards and other fixed utilities.

d. Principal elevation showing overall dimensions, finished floor and ceiling levels, and outside grades, with general indication of materials.

e. Sections as necessary to explain any conditions not made clear in the other drawings.

f. Proposed water supply and sewage disposal facilities.

g. Where remodelling is involved, indicate the present use of spaces concerned so that the net loss or gain in accommodation can be readily ascertained.

h. Overall sizes for all rooms and spaces within the structure or, as an alternative, a schedule on the face of the drawings may be indicated.

i. An estimate should be submitted with the sketch plans showing all fixed equipment included in the proposed building contract. The estimate should show the total number of cubic feet and the cost per cube foot. If this estimate is not reasonably within the limits of the approved proposal, it may be necessary to reconsider the building programme and make such adjustments as may be expedient.

j. Record of Plans

The Elementary School Inspector should retain a copy of the sketch plans of Elementary schools as approved for record purposes.

The Department retains a copy of the sketch plans of Secondary schools as approved for record purposes.

12. FINAL PLANS AND SPECIFICATIONS

Complete working drawings and specifications (architectural, structural, electrical and mechanical) covering the site, all phases of construction and all fixed equipment should be prepared in accordance with the sketch plans which have been approved by the Department.

FINAL PLANS AND SPECIFICATIONS (Cont'd)

When these plans have been approved by the Board, they should be submitted to the Department for approval.

The final plans and specifications should include complete information covering the entire project to the point where the Board and contractor should have a clear understanding of the extent of the proposed contract.

Due to the variety of school building types and methods of construction, it is impossible to enumerate all the items which should be covered. The following list, while not complete may, however, serve as a guide.

a. Site Plan

1. Site plan to scale showing points of compass and the size and shape of the entire site.

2. Block plan of new building, existing building, and any likely future additions, all accurately located.

3. Finished contours, with finished grades at building and elevation of the first floor. General landscaping with location of walks, drives, playing areas, parking, bicycle racks, garden plots, etc. Adjoining sidewalks, streets, etc.

4. Location of sewage disposal system or sewer, water, gas, and electrical services.

b. Architectural Plans

1. One for each floor and of the roof at not less than 1/8" scale. These should include complete figures so that all sizes of rooms, wall thickness, methods of fabrication, materials, etc., can be readily determined.

2. All fixed utilities, built-in equipment, door swings, etc., should be clearly indicated.

3. If the structure is in the nature of an addition or alteration, there should be a clear indication to show those parts which may be existing, added or remodelled.

4. The purpose of each space should be designated and overalls or areas given for all instructional areas.

c. Elevations

All at the same scale as the plans. Vertical dimensions for all openings, trim, belts, cornices, grade lines, steps, areas, floor levels, etc., should be included.

d. Sections

1. As many sections as may be required at the same scale as the plans to show the necessary details of construction.

2. A typical classroom wall section through a window at not less than $\frac{1}{2}$" scale showing floors, walls, sills, jambs, heads, ceilings, cornices, parapets and copings and indicating the true relation of window heads to ceilings.

FINAL PLANS AND SPECIFICATIONS (Cont'd)

d. Sections (Cont'd)

3. Typical stairs, corridors, rooms, furred ceilings, built-in equipment, fixtures, floor construction, levels and thicknesses, wall constructions, windows, doors, finish materials, roof construction, etc.

e. Details

The plans, elevations and sections should be supplemented by the following detailed plans as found necessary:

1. Sections of walls, footings, foundations, slabs, floors, windows, doors, cornices, roofs, etc.

2. Trim including doors, windows, panelling, acoustic treatment, chalkboards, tackboards, etc.

3. Built-in fixtures and equipment including counters, cabinets, showcases, lockers, shelves, drawers, etc. (Such items of standard manufacture need not be detailed.)

4. Stair details showing treads, risers, handrails, landings, newels, etc.

5. Schedule of interior finishes such as floor, base, wainscote, wall, ceiling, and trim.

f. Structural

1. Drawings at the same scale as the architectural plans, unless this information is shown on the architectural plans.

2. The sizes of all concrete and steel columns, beams, trusses, girders, joists, slabs, reinforcing and method of fireproofing structural members.

3. Complete details, diagrams, and schedules as required for a complete understanding of the drawings.

4. A schedule of live loads used in the design of the structure.

g. Plumbing

1. Drawings at the same scale as the architectural plans, unless this information is shown on the architectural plans.

2. All footing drains, storm and sanitary sewer lines, water supply system with pipe sizes, stacks, vents, traps, cleanouts, valves, tanks, fixtures, bibbs, hose cabinets.

3. Connections to water and sewer services should be indicated. If private systems are required, the sewage disposal and water supply systems should be shown in sufficient detail to make their installation and operation clear.

h. Heating and Ventilation

1. Drawings at the same scale as the architectural plans, unless this information is shown on the architectural plans.

2. The size and type of boilers, boiler room equipment, pumps, tanks, valves, traps, supply and return lines, fall of lines, zones, controls, etc.

FINAL PLANS AND SPECIFICATIONS (Cont'd)

Heating and Ventilation (Cont'd)

3. Type, size, location, and capacity of motors, fans, ventilators, ducts, grills, heating units.

i. Electrical

1. Drawings at the same scale as the architectural plans, unless this information is shown on the architectural plans.

2. All connections inside and outside, the sizes of all conduits and lines, the location and capacity of all outlets, circuit breakers, switch panels, fuse-boxes and controls for both lighting and power.

3. Clock, bell, radio, and alarm systems, including all equipment, lines, outlets, and controls.

4. The type and capacity of all lighting fixtures. A schedule showing the expected artificial light intensity in foot-candles on the working plane in each room should be submitted.

j. Specification

A complete specification should accompany the final drawings. The specification should supplement the drawings so that the two, if read in conjunction with one another will give a complete detailed understanding of the proposed building contract.

k. Record of Plans

The Elementary School Inspector should retain a copy of the final plans and specifications of elementary schools as approved for record purposes.

The Department retains a copy of the final plans and specifications of secondary schools as approved for record purposes.

13. DETAIL LAYOUTS

Detail plans of special areas such as shops, home economics, laboratories, etc., may be submitted with the final drawings but in any case sufficiently ahead of construction to permit the proper location of utilities and built-in equipment. These drawings should be submitted in duplicate on separate sheets if possible.

14. RESPONSIBILITY

Architects, engineers, contractors, supply and equipment houses, as part of their services on a building project within the terms of the contract with each other and with the Board, are responsible for producing a building which is structurally and mechanically safe and sound and in accordance with the suggestions contained in this guide.

Failing the existence of local by-laws the National Building Code of Canada should be taken as a minimum requirement. All local by-laws and Provincial regulations respecting safety and health must be observed.

RESPONSIBILITY (Cont'd)

The Department of Education takes none of this responsibility. Its function in connection with building programmes lies in helping to secure, with reasonable economy, the best possible educational facilities.

15. METHOD OF ESTIMATING

This method is intended as a guide which may be used by Boards for preliminary estimating purposes. It is not suggested that this method be used by architects or contractors.

a. Find the total number of square feet of instructional area required.

Refer to Items 205 to 214 for Elementary Schools
Refer to Items 305 to 338 for Secondary Schools

b. For elementary schools add an equal amount to the instructional area (Item a) and multiply this amount by $10.00 per square foot.

c. For secondary schools add one and a half times the amount of instructional area (Item a) and multiply by $10.00 per square foot.

d. This will give a rough estimate of the cost of the building. It does not include cost of site, architect's fees or equipment.

e. Considerable variations may be expected depending upon the extent of auxiliary services, quality of construction, extent of appointments and the building market. Differentials may be applied as may seem to be expedient.

f. The cost of furniture and equipment may be found by taking off the amount indicated.

Refer to Items 204 to 224 for Elementary schools
Refer to Items 305 to 354 for Secondary schools

g. Where space and equipment are set aside for the express use of community centre purposes, an additional allowance over and above that in Item c is likely to be required. This amount can become quite substantial and is not subject to grant.

16. GRANTS

Legislative grants are at present paid under the regulations set forth in Circular Grants General 12. Any expenditure in excess of the maximum therein set forth must be met by the municipality or municipalities concerned.

17. PICTURES

The Department is interested in making a record of schools with special or other desirable features.

Pictures desired are one or more elevations of the building. These could be taken immediately upon completion of the building. At a later date when the school is equipped and the students in attendance, it would be of interest to have photographs of the various instructional areas and auxiliary spaces, particularly if some special features are in evidence.

PICTURES (Cont'd)

It would be appreciated if the pictures were accompanied by a brief description of salient points.

In the case of Elementary schools the Inspector is requested to forward such pictures to the Department. Pictures of Secondary schools may be forwarded to the Department by the Board.

GENERAL CONSIDERATIONS

common to

ELEMENTARY AND SECONDARY SCHOOLS

100. GENERAL CONSIDERATIONS

a. These considerations are in the nature of a guide which may assist Boards, School Administrators, Architects, Engineers, Teachers, Contractors, Supply Houses and other agencies to plan, construct, equip and maintain satisfactory school accommodation.

b. Those items of general interest which apply to all schools are shown in this general section.

c. The existing classification of schools in Ontario to which this guide has reference may be described as follows.

Elementary Schools

Rural Public Schools
Urban Public Schools
Rural Separate Schools
Urban Separate Schools

Secondary Schools

Continuation Schools
High Schools and Collegiate Institutes
Vocational Schools

Any suggestions contained in this guide are subject to the Acts and Amendments together with Regulations governing the establishment and operation of the schools concerned.

d. The outline of procedure which should be followed for the establishment, remodelling, or additions to various schools is shown as follows:-

Elementary Schools Item 1 to Item 3.
Secondary Schools Item 4.

e. Nothing contained in these suggestions is intended to restrict the design, materials or equipment for school accommodation. On the contrary, every consideration should be given to progressive design and the use of new materials and equipment which will promote the efficient and economical establishment of adequate and reasonable school facilities.

101. SELECTING THE SITE

a. The building and site should be considered as a unit and developed so that they offer the maximum service to the community. It is desirable that an architect be consulted before the site is purchased.

b. Areas recommended for elementary schools are shown in Item 200, and for secondary schools in Item 300. Apart from the size, the shape and contours of the site should be such that it may be fully utilized.

SELECTING THE SITE (Cont'd)

c. The site should be centrally located. In urban centres it is desirable that pupils attending elementary schools be not obliged to travel more than one mile. Three miles should be considered the maximum distance for pupils in urban centres attending secondary schools. In suburban and rural areas the shifting of residential districts, ease of transportation and the consolidation of schools may involve distances which would justify the introduction of a bus service.

d. It is important that the site be free from dust, noise, smoke, fumes or other distractions or nuisances. It is essential that the site be well removed from main traffic arteries or busy highways. If possible, the pupil body should not be required to pass through busy industrial or business districts. The best location would be in an open rural or residential area controlled by reasonable building restriction by-laws. Future developments should be checked with local town planning authorities.

e. The site need not be flat over its entire area, provided that there is a suitable location for the building. Other flat or gently sloping ground could be used for play areas. The natural contours may then be suitably landscaped.

f. Sod is the best surface for general playing areas; failing this, a sandy loam is desirable. Cinders and gravel should be avoided. If the soil is of a heavy nature it may be necessary to provide sub-surface drainage for playing areas.

g. Paved courts may be necessary to provide play areas in the spring and fall. Such areas might serve for parking when the school is used for community purposes.

h. The site should be developed to the point where the entire pupil body will find opportunity for out-door games and activities. The development should also be such that adults and adolescents will be encouraged to use the grounds as a community centre.

i. The cost of the site should include an allowance for grading and the initial cost of sodding and landscaping. It will also be necessary to set aside an annual sum for its subsequent development and maintenance.

102. LOCATING THE BUILDING ON THE SITE

a. The location of the building on the site should be carefully planned. It is desirable that the building be set back 100 feet from the property line. It will promote safety and quietness and will also give the building a better setting or appearance. Future extensions should not be closer than fifty feet to the property line.

b. The building should be set on an elevated part of the site and grades arranged to fall gently away from the building to ensure good surface drainage conditions.

c. It is important that drives, walks, courts, aprons, and parking areas be laid out to provide convenient and safe means of entrance and exit.

103. GENERAL BUILDING REQUIREMENTS

a. The building should be planned to provide accommodation for the approved activities of the school concerned. The areas thus provided should be well lighted, heated, ventilated and appointed.

b. Expenditures for non-essential ornamentation, either interior or exterior, cannot be justified. Skilful architectural design makes it possible to erect a simple but dignified building which will be a credit to any community.

c. The school must be sound structurally as matters of safety and health are of greatest importance. The National Building Code of Canada should be taken as a minimum standard. Local building codes must be observed. The requirements of the fire marshall, officer of health and other provincial and municipal authorities must be met.

d. The single storey structure is desirable for small schools. The larger school is likely to require two storeys. Careful consideration should be made before three storey structures are decided upon. It should be noted that as the number of storeys increase, the vertical movement of pupils becomes a problem to the point where it finally becomes a hazard. Building codes require a more expensive type of construction for the multi-storey structure in order to provide adequate fire protection. Large multi-storey buildings usually surround a court which introduces problems of lighting and ventilation. Such buildings are justified only in city areas where the site may be restricted.

e. The single storey structure offers advantages in the layout of the building. Noisy areas may be isolated. Entrances for all purposes are easily arranged. Natural light and ventilation become simple. Extensions may be added more conveniently.

f. Use of basement space for instructional areas is not recommended. Apart from boiler rooms, coal bunkers, storage rooms, etc., areas in the basement are of little use.

g. Auditoriums, cafeterias and gymnasiums should be kept as near ground level as possible for both safety and convenience. Wood floors of any kind, laid below ground level and not well ventilated, lead to high maintenance costs.

h. All instructional areas require an abundance of natural light. The building should be oriented so that the majority of rooms will be assured of good light.

i. The entire problem of the layout and construction of the school can safely be entrusted to an experienced school architect.

104. CIRCULATION WITHIN THE BUILDING

Provision for circulation of traffic within the school is most important. The traffic reaches peak conditions several times a day. During peak periods traffic flows in opposite directions. Corridor crossings should be eliminated as far as possible. Stairwells should be located with a view to reducing corridor traffic. In large schools parallel horizontal routes may be necessary. The auditorium should be situated to permit alternate routes which do not cross or converge. In large schools good design does not permit constricted areas through which pupils must pass from one major area to another. The passage of pupils through one instructional area to another such area is not recommended.

105. PROVISION FOR FUTURE ALTERATIONS

a. Educational ideas and needs change with the times. It is, therefore, necessary that the building lend itself to such changes as may be required.

b. It is desirable that all instructional areas provide the maximum amount of usable space for the purposes designated. The practice of cutting such spaces into small storerooms, built-in cupboards, fixtures, etc., should be avoided, unless it can be guaranteed that the area concerned is not going to suffer change or rearrangement during the life of the building.

c. Partitions between rooms or shops should be readily removable without structural damage or the disturbance of utilities such as pipes, ducts, etc.

d. Toilets, stairwells, entrances, etc., should be laid out to obtain maximum runs of room space which would permit future rearrangement of intervening spaces.

106. PROVISION FOR FUTURE ADDITIONS

The building should be designed so that future additions may be made. The following suggestions are offered.

a. Carry corridors through to outside walls. If the ends form pockets they may be partitioned off to form temporary offices or storerooms.

b. Avoid placing windows in walls which may be blanketed by extensions.

c. Make boiler room sufficiently large for the installation of additional equipment. Leave flues and utilities of sufficient size and arrange for convenient cutting in of future lines.

d. Make sure that entrances and exits will not be interfered with.

e. Make service entries, water, gas, sewer, etc., sufficiently large and locate them so that they will not be disturbed.

PROVISION FOR FUTURE ADDITIONS (Cont'd)

f. Leave all mechanical trades (plumbing, heating, ventilation, electrical, fire alarm, etc.,) so that additions may be conveniently tied in.

g. Indicate on the plans the position of possible future additions.

107. DEGREE OF FIRE RESISTANCE IN CONSTRUCTION

a. Buildings should meet the requirements of local building codes. In the absence of a local code the requirements of the National Building Code should be observed.

b. One storey buildings

Buildings of not more than one storey and above grade may be of frame construction, that is, with walls wholly or partly of wood. They should be limited to not more than 6 classrooms with the usual service rooms not more than a total of 6000 square feet. Provided that the building is broken up into units as mentioned and divided with properly constructed firewalls there need be no limitation on the total number of rooms or area.

Any space under any part of this type of building should be of Class 1A Fire Resistive Construction. Access to such space should be in compliance with the requirements for Class 1A Fire Resistive Construction.

c. Two storey buildings

It is desirable that buildings of two storeys above grade be of fire resistive construction. Type 1C of the National Building Code, as a minimum classification.

If such buildings are of a lower classification than the above, the stairs, the corridor, walls, floors and ceilings should be of fire resistive construction. Stair towers should be enclosed with materials having a minimum of one hour fire rating. Doors opening from stair towers should have the same fire rating as the other portions of the stair tower enclosure. In all other respects such buildings should meet the provisions of the National Building Code.

d. Buildings over two storeys

Buildings over two storeys in height should be of Class 1A or Class 1B construction as defined by the National Building Code.

e. Fire Escapes

Properly designed buildings do not require fire escapes; consequently, outside fire escapes will not be approved for new buildings.

108. FIRE PRECAUTIONS

a. Alarms

1. School buildings should be equipped with an adequate fire alarm system. The system may be manually operated and quite simple in small schools.

2. Larger schools may require an electrical system which must be clearly audible in all parts of the building.

3. There should be at least one alarm sounding station conspicuously located in the corridor of each floor and within 50 feet of every shop, room, or laboratory which it serves. Stations are also required in or near heater rooms, auditoriums, cafeterias, stages, etc.

4. Alarm stations should be painted red and clearly marked "Fire Alarm".

5. Fire alarm systems must be entirely independent of other signalling systems and the tone of the bell must be easily distinguishable from that of any other bell used in the school.

b. Routes

1. Properly organized methods of evacuating the building should be arranged and meet with the approval of the local fire authorities. Routes to be followed together with exits should be clearly marked. The effectiveness of the arrangements should be tested by periodic fire drills.

2. In very large schools which operate at night it may be necessary to install an auxiliary exit lighting system to provide for power breakdowns.

c. Fire Extinguishers

1. Fire extinguishers should be provided for all school buildings. It is essential that they be checked periodically for condition and that the date of inspection is noted on the extinguisher. They should be located near each fire alarm sounding station.

2. The soda-acid type of extinguisher is satisfactory for general purposes. It must, however, be protected from freezing. It should not be used for electrical or flammable liquid fires.

3. The pyrene (tetra-chloride) hand extinguisher is particularly good for electrical fires. It should not be used on hot metals or in confined spaces because of the toxic fumes which will be given off.

4. The carbon dioxide extinguisher is well adapted to small flammable liquid fires and for general use. It has limitations, however, with respect to deep-seated fires.

5. The foam type of extinguisher is also effective for small flammable liquid fires and for general use.

FIRE PRECAUTIONS (Cont'd)

c. Fire Extinguishers (Cont'd)

6. All extinguishers should be housed in cabinets or recesses and mounted so that they are readily seen and instantly available.

109. CONCENTRATED OCCUPANCY

a. Auditoriums, playrooms, gymnasiums, cafeterias and galleries are designed for a specified maximum occupancy. Spaces for dual purposes such as the auditorium-gymnasium must of necessity be furnished with loose chairs. The maximum number of persons in areas with loose chairs should be restricted to 500. In any concentrated occupancy there should be an allowance of 6.5 to 7 square feet per occupant. Aisles and exits must be kept clear at all times.

b. The building itself is designed for a normal pupil occupancy. The occasional school function may overtax occupancy to the point where a hazard is created which may prove dangerous in the event of fire or panic.

c. The design of the building provides adequate corridors, stairwells, exits for all reasonable pupil occupancy and public functions. Overcrowding or the restriction of safe adequate means of exit becomes the responsibility of the board. If the board has any reason to question the wisdom of any proposed programme which concerns the safety of the occupants, then the local fire authorities should be consulted.

110. ALLOWABLE LIVE LOADS (Subject to local by-laws)

Classrooms	50 lbs. per sq. ft.
Laboratories	50
Libraries (Reading Rooms)	50
Libraries (Stack and Book Rooms)	125
Shops (With loading equivalent to laboratories)	50
Shops (Mechanical, electrical, etc., according to equipment)	100-200
Auditoriums, Stages and Galleries (not fixed seats)	100
Auditoriums and Galleries with fixed seats	75
Cafeterias	75
Cafeterias (to be used as Assembly Rooms)	100
Gymnasiums	100
Gymnasium Galleries for spectators only	75
Stairs and Fire Escapes	100
Corridors to Rooms with Live Load of 50 lbs	50
Entrance Corridors, Corridors to Auditorium, Cafeterias and other rooms with Live load of 100 lbs. or more	100
Fire resistive ceilings having accessible space over	25
Roofs - flat	40
slope of 50 degrees and greater	10
(for variation between these limits, see the National Building Code)	
Wind Load, normal to surface	20

111. ELECTRICAL

a. General

1. All electric wiring and apparatus should be in accordance with the current edition of the Canadian Electrical Code, and the requirements of the Ontario Hydro-Electric Power Commission.

2. Arrangements should be made with the local authorities for the most suitable and economical supply of electricity.

3. Wherever 60-cycle is available, it should be used. It is highly desirable for both efficiency and economy.

4. The distribution system for lighting and convenience outlets should be 110/220 volt, single phase.

5. Where power is used for machines operated by pupils, 220 volt, 3 phase is recommended. Higher voltages present additional hazards and are not desirable. They may, however, be considered.

b. Switches and Controls

1. All switches should be flush type toggle or tumbler switches and should in general be installed on the knob side of entries. Key switches should not be used for control of lights in classrooms and workrooms.

2. Classroom lights should be operated by at least two switches. Where rows of lights are parallel to the main window, each row should be controlled separately.
   Automatic photo-electric control of classroom lights may be considered.

3. In corridors and stairways the lights should be controlled by three-way switches located at each end of these spaces.

4. Remote control switches should have pilot light protection.

5. In auditoriums and assembly rooms, some or all house lights should be controllable from a switch located convenient to the point of entry and from the probable location of a portable movie projector, unless the house lights are controlled from a stage lighting panel which can be reached by a lighted passage with conveniently located switches. In this case, a communication system of some type should be provided between the projector and the stage lighting control panel.

6. Switches controlling circuits of 8 amperes or greater capacity should be rated at 20 amperes. Switches controlling circuits of less than 8 amperes capacity should be rated at 10 amperes. Switches controlling incandescent lamps rated at 750 watts or more should be of 30 ampere capacity.

7. Master controls conveniently located and protected with locks should be provided in all General Shops, Vocational Shops, Home Economics, etc. These controls should provide ready means for disconnecting the power in the entire shop to meet emergency situations.

ELECTRICAL (Cont'd)

c. Convenience Outlets

1. The number and location of outlets should be in accordance with the immediate and probable future use of the space.

2. Classrooms should be provided with at least two double outlets, one at the rear of the room and one at the front.

3. Electric heat outlets should have pilot light protection.

4. Auditoriums and assembly rooms not equipped with a projection booth should be provided with a convenience outlet at the probable location of a portable movie projector.

5. In Vocational Shops, General Shops, and other spaces where portable electric devices are used, convenience outlets should be of the grounded type to suit the 3-cord conductors supplied with such machines.

d. Intercommunicating and Radio Systems

1. In larger schools, consideration may be given to some form of intercommunication system. The system chosen and its extent may be determined by the requirements of the individual school and the complexity of its administration.

2. At least one built-in speaker cable should be provided between the projector location in the auditorium and the stage.

3. An antenna system should be considered for good radio reception, particularly where radio programmes form an important part of the school programme.

e. Clocks & Programme Systems

All rooms, shops, and other areas where pupils assemble should be provided with a reliable clock. The clocks or clock systems should be carefully selected and due consideration given to the availability of any necessary servicing, adjustment and repair.

The kind and size of school determines the clock system required. The following suggestions are made.

1. Elementary Schools: Clocks which may be independent of one another are satisfactory.

2. Secondary Schools: Since these schools operate on a rotary system, it is important that time be controlled by a master clock.

This may be done by the installation of a master clock in the administration quarters and secondary clocks in all rooms, shops and other areas throughout the building. Each secondary clock should be provided with a bell or buzzer to announce programme changes.

An alternative arrangement is to install a master clock in the administration quarters with bells or buzzers in all rooms and shops which would announce programme changes. It might be supplemented by a few secondary clocks at strategic points.

ELECTRICAL (Cont'd)

f. Fire Alarm Systems

Refer to Item 108 a.

g. Service Entrance

Wherever practicable, the service entrance cable from the nearest pole line to the electrical service room should be installed underground.

112. HEATING

Indoor air free of pollution and automatically controlled for volume, temperature and humidity is desirable for health and efficiency. Such systems are technically possible but economic considerations together with interference by non-technical personnel with controls, etc., indicate that elaborate systems are not satisfactory.

a. Types

1. In general, direct radiation and convectors, or wall and floor panels heated with hot water, are most satisfactory. In large installations or in buildings without basements, pumps are required for circulation.

2. Variable temperature, low pressure steam will also give reasonably good results with direct radiation or convectors, but some difficulty may be expected with panel heating systems. In addition there is an increased possibility of noise.

3. In small schools (one or two rooms) a hot air heating system may be considered. It should be noted that such systems depend upon recirculation of air which tends to spread dust, odours, and even infection.

b. Requirements

All parts of heating systems should be designed to ensure 70°F. in all rooms used by students or staff, at the recognized base outdoor temperature for the particular locality. This is usually taken as 15°F. above the lowest recorded local temperature.

1. Temperatures in corridors, washrooms and gymnasiums (if used for physical education only) may be 65°F.

2. Heating equipment should be designed to allow the introduction of the required volume of air for ventilation.

3. Direct heating surfaces (including convectors) should be placed beneath windows and extended as nearly the full length of them as reasonably possible. They should be preferably wall hung. Screens or radiator enclosures are of advantage as they reduce direct radiation of heat on nearby occupants.

c. Boiler Plant

1. Boiler and fuel rooms should be separated from other parts of the building by fire resistive construction.

2. Mechanical firing such as stoker or oil burner is recommended.

HEATING (Cont'd)

d. Controls

1. Automatic temperature control is recommended. Central control, manual or automatic, is suitable for small schools; automatic zone control is usually sufficient in larger schools.

2. Auditoriums, gymnasiums and portions of the building used outside of school hours should be on independent zones of the heating system.

113. VENTILATION

a. Types

1. Bilaterally lighted rooms may be ventilated by window supply and window exhaust.

2. In small schools a positive supply or a window supply with a positive exhaust is necessary.

3. Auditoriums, cafeterias, gymnasiums, dressing rooms, kitchens, home economics room, laboratories, shops, etc., should be ventilated by a system capable of exhausting any pollution, odours or fumes. Supply ventilation may have to be added in some cases, and where the system serves one space (with associated space) some recirculation of air may be permitted.

4. Wardrobes and lockers should be provided with adequate ventilation. They may be used partially or entirely to form the exhaust from the room or space to which they are attached.

b. Requirements

1. The minimum quantity of outdoor air supplied to a classroom or working space when in use should be 15 cubic feet per minute per occupant. This may be ensured by exhaust ventilation, relying on windows for air ingress, or by supply ventilation designed for this full capacity.

2. Washrooms should be equipped with exhaust ventilation of not less than 10 air changes per hour.

3. Cloak rooms, kitchens and rooms where food is prepared or stored should have not less than 6 air changes an hour of exhaust ventilation.

c. Distribution of Air

1. Supply or exhaust grilles, or the opening sash of windows should be located in the rooms in a manner ensuring draftless introduction of fresh air over the entire area of the room.

2. Deflectors should be provided wherever windows serve as source of air supply. Ventilating grilles should not be placed in floors.

3. Where ventilating grilles from adjacent rooms connect into a common duct, they should be arranged to eliminate transmission of light and sound between the rooms.

VENTILATION (Cont'd)

d. Duct Design

Ducts should be of fire resistive material and if insulated, the insulation must also be of fire resistive material. Exhaust ducts should not terminate inside the building. All air inlets or exhaust outlets should be protected from the weather with hoods or caps. Exhaust air outlets should be located so that the lower edge will be not less than 3 feet above the upper edge of any window, or other opening into building, located within a horizontal distance of 20 feet.

114. PLUMBING

Plumbing installations should be in accordance with the requirements of the Provincial Department of Health and the local Medical Officer of Health. Where local codes do not exist, the requirements of the National Building Code of Canada should be observed.

a. Water Supply

Should a water supply other than the municipal supply be required, then it is necessary that the supply be approved by the Ontario Department of Health. This may influence the selection of a school site. Arrangements should be made with the Department of Health for periodic tests.

b. Sewage Disposal

1. Schools are required to have adequate and safe means of sewage disposal. Plans for such systems must be approved by the Ontario Department of Health.

2. No latrine or range of chemical toilets will be approved where water is available for the operation of flush toilets.

c. Hot Water

An adequate supply of hot water is desirable in all schools.

d. Fixtures

1. The number and kind of fixtures required is as follows.

Elementary Schools refer to Item 222.
Secondary Schools refer to Item 351.

2. The type of fixtures selected should be designed to encourage desirable habits of cleanliness and health.

e. Water Closets

Should be porcelain or vitreous china, flush rim, elongated bowl or extended rim, with open front seats.

f. Urinals

Should be porcelain or vitreous china, individual type, properly flushed with uniformly distributed spray. Where stall types are used, rims should be set flush with or slightly below the floor level with the floor pitched toward the urinals.

PLUMBING (Cont'd)

g. Lavatories (Hand Basins)

1. Should be of earthenware or enamelled iron. If heavy grade vitreous china basins intended for institutional service are procurable, they are desirable.

2. Spring faucets are not recommended but where used should be of the delayed action type. Mixing faucets with spray heads are desirable.

h. Drinking Fountains

1. Should be of impervious material and of a type which will not permit the mouth of the drinker to come in contact with the nozzle or permit water to fall back upon the nozzle.

2. Drinking fountains should be entirely separate and well-removed from lavatories and sinks. They should not be placed in washrooms.

3. Drinking fountains should be installed so that they do not become an obstruction in corridors.

i. Gas

Where gas is used for instructional work in science rooms, home economics, etc., involving two or more outlets a master valve should be provided in each room or shop concerned. This valve should be conveniently located and furnished with a locking device.

j. Bibbs

An adequate number of outside keyed hose bibbs should be provided at strategic points.

115. WASHROOMS

a. The establishment of proper habits of health and sanitation is essential. Washrooms should be clean and bright, well ventilated and properly appointed.

b. While the number of washrooms will vary with the size of the school there should be at least one for each sex on each floor of the building. They should be located so that they are readily accessible to the various rooms which they are intended to serve. It is desirable that entrances be reasonably unobtrusive and properly screened. Entrances to washrooms should not lead off directly from areas of concentrated occupancy such as playrooms, assembly halls, etc. Washroom windows should be glazed with obscure glass where necessary to ensure privacy. The practice of placing washrooms in second rate, poorly-lighted inaccessible quarters should be condemned.

c. Water closets should be individually enclosed by stalls with doors. The height of stall partitions should be such as to permit good light and ventilation.

WASHROOMS (Cont'd)

d. Each washroom should be provided with a requisite number of soap and towel dispensers, tissue holders and mirrors. Sanitary napkin dispensers and disposal cabinets should be installed in washrooms for women teachers and in girls' washrooms in secondary schools.

e. Schools proposing to make extensive use of the auditorium, gymnasium, etc., for community centre purposes should consider the establishment of washrooms for the express use of adults.

116. LIGHTING (Daylight & Artificial Combined)

The importance of good lighting both natural and artificial requires careful consideration. Provision for the full use, development and conservation of the eyes is essential especially among the immature.

All pupils should be provided with proper seeing conditions. This means that all parts of rooms and shops, together with associated appliances used for instructional purposes, must be provided with suitable light at all times.

The design of an illumination system either natural or artificial includes the following factors.

1. Quantity or intensity of illumination.
2. Spectral quality or colour of light.
3. Distribution of illumination.
4. Distribution of brightness.

A brief general outline of these four factors may be of interest. The complete design, however, must be worked out by the architect in collaboration with competent lighting authorities. The Hydro-Electric Power Commission and some commercial companies maintain good lighting divisions concerning artificial lighting. Such services may be secured without obligation.

a. Quantity or Intensity of Illumination

1. Intensity of illumination is measured in foot-candles. This cannot be done visually. A foot-candle meter is necessary.

2. The intensity of illumination required for different activities varies according to the purpose for which it is required. Thus exacting activities such as sewing or drafting require a much higher intensity than physical training.

3. The intensity required for spaces within the school are indicated under the various designated spaces.

Elementary Schools, refer to Items 205 - 224.
Secondary Schools, refer to Items 305 - 354.

4. The intensities indicated are those required on the normal working plane. This refers to desk surfaces in classrooms, the floor of the gymnasium, the bench surfaces in shops, etc.

LIGHTING (Daylight & Artificial Combined) (Cont'd)

a. Quantity or Intensity of Illumination (Cont'd)

5. Since chalkboards are vertical, the illumination from general lighting units will not be equal to that on the working plane. Supplementary illumination with special units will be required.

6. It is well to remember that the initial intensity when the building is new is likely to be higher than that when the building has been in use for some time. The wear and tear on decoration, the degree of maintenance and cleaning, the loss of efficiency in mechanical equipment all contribute to some loss in light intensity. Due allowance should, therefore, be made so that the required intensity will be maintained after the school settles down to normal operation.

b. Spectral Quality or Colour of Light

1. An equal intensity of light from any source enables students to work on ordinary classroom (black and white) activities with an equal degree of facility.

2. When coloured objects are viewed, their apparent colours are influenced by the colour of the light falling on them.

3. Natural daylight, tungsten filament incandescent lamps, and white or daylight fluorescent lamps constitute light sources. It is generally recognized that a higher intensity of daylight or fluorescent light is required than incandescent light for equal appearance.

4. Artificial light sources should be given most careful consideration where the proper interpretation of colour is a factor such as in art and sewing.

5. It might be noted that incandescent light is desirable in places where food is prepared or served since the nature of this light enhances the appearance of the product.

c. Distribution of Illumination

1. It is desirable that there be as little variation as possible in the intensity of illumination on the working plane.

2. High variations in intensity of illumination produce glare which results in eye-fatigue. From a practical standpoint the ratio of illumination on the brightest desk should not be more than twice that on the darkest desk.

d. Distribution of Brightness

Brightness contrast between an object to be seen and the background against which it is seen is necessary for good vision. The following suggestions for the elimination of brightness contrast are offered.

1. Adequate control of direct sunlight by baffles, blinds, etc.

2. A few large rather than small windows with dark spaces between.

d. Distribution of Brightness (Cont'd)

3. Use of light-coloured paints or finishes on walls and ceilings.

4. Use of light-coloured furniture.

5. Use of light-coloured chalkboards with dark-coloured or black chalk.

6. Artificial light sources have a brightness which is not excessive in comparison with the average brightness of the general field of view.

117. DAYLIGHTING

The high values of illumination intensity obtainable by daylight throughout a large portion of the school year as well as the highly desirable effect of openness produced by large window areas, makes the problem of illumination by daylight of prime importance in all schools, but particularly in elementary schools. Several systems of classroom daylighting are discussed. In all recommended systems, the prime source of light is a large window in the outside wall of the room. This window should extend from not more than 3 feet above the floor to as close to the ceiling as is useful for admitting skylight directly to the working plane at the opposite side of the room.

a. Unilateral Lighting

Until recently, the standard type of classroom contained large windows in one outside wall. The chief disadvantage of this system is that the inside row of desks obtains only about one-tenth of the illumination of the outside rows, and therefore, requires supplemental lighting.

An improvement on this system could be obtained by the installation of special directional glass blocks in the upper part of windows which ensure automatic control of direct sunlight by reflection to the ceiling and into the far areas of the room.

Wherever the unilateral system of daylighting is used, the window should be to the left of the students.

b. Corner Lighting

This type of room is highly recommended for kindergartens and nursery schools, or where a bright cheerful appearance is desirable. This type of room may be considered equal to, or better than, unilaterally lighted rooms for prolonged visual effort.

c. Bilateral Lighting

1. Vertical or sloped clerestory windows, in addition to the large window in the outside wall, increase the daylight on the inside rows of desks and produce a more uniform distribution of illumination. This type of daylighting is recommended for all classrooms, but is a necessity where electricity is not available at reasonable cost. Such construction, of course, is practical only in one-storey schools, or on the second floor of two-storey schools.

DAYLIGHTING (Cont'd)

c. Bilateral Lighting (Cont'd)

2. Precautions must be taken to prevent direct sunlight from entering the room at undesirable angles through the clerestory windows. The preferred aspect of the windows is east-west.

3. In classrooms of this type, it makes little difference whether the students face one end of the room or the other.

d. Light Obstruction

The distance from any schoolroom windows (including clerestory windows) to any light obstruction, such as walls and buildings, should be twice the height of that obstruction above the sill of the window.

e. Control of Glare

Adequate control of sky glare and direct sunlight should be provided in the form of movable or preferably fixed baffles or by suitable shades. Shades should be of a highly diffusing, light-coloured material, and should operate in two sections up and down from the centre of the window.

118. ARTIFICIAL LIGHTING

Provision should be made for electric illumination wherever possible.

a. In rooms which are used at night for any school or community function, the general artificial illumination on a plane 30" above the floor should be designed to provide the recommended intensities for the designated spaces as listed.

Elementary Schools, Items 205 - 224.
Secondary Schools, Items 305 - 354.

b. In rooms which are not used at night, the general artificial illumination should be designed for slightly lower values, as some supplementary daylight will always be available.

c. No surface of a lighting unit within an angle of approximately 45 degrees from the pupil's normal line of vision should have a surface brightness exceeding 1.5 candles per square inch in the direction of the student's eyes.

d. Lighting units of any kind should be as simple as possible and should be easily serviced and cleaned.

e. In unilaterally or corner lighted rooms, each row of lights parallel to the long wall of the room should be controlled by a separate switch. The inside row of lights may have to be in operation continuously while the room is in use.

f. In bilaterally lighted rooms, separate control of lights is not a necessity.

119. DOORS

In general most fire regulations dictate that all doors in institutional buildings should swing in the direction of exit travel. This may be accepted as a general rule but the following exceptions are suggested for doors to classrooms and other rooms with not more than 40 occupants subject to approval by the local fire authorities.

a. In one-storey buildings of frame construction, a fire exit should be provided from each room to the outside. The door should open in and should be equipped with hardware that will not permit of the door being locked against exit.

It has been proved by a careful survey that snow and ice conditions in many localities definitely prohibit the outward opening of fire doors at ground level. This is particularly true if there are a number of such doors since the matter of snow clearing is likely to be neglected.

b. Classroom and other doors which open into the school corridor are a frequent source of accident. In addition, in case of fire or panic, doors opening into the corridor present a dangerous restriction in corridor width. Two alternatives are suggested to overcome this situation.

1. The first is to recess the door into the corridor wall so that it will not project into the corridor at the end of a right angle swing. If it projects at all, the projection should not be more than 6". This arrangement will permit the door to swing in the direction of exit travel.

2. The second is to swing the door into the room concerned. This method would, of course, need the approval of the local fire authorities.

c. Failing one of these alternatives, then doors opening into the corridor should be hung to swing 180° or back flush with the corridor wall. This solution should be adopted only on the insistence of local fire authorities after they have refused to consider the other alternatives mentioned.

d. Unless other factors forbid, then one door for classrooms for 40 students is considered sufficient.

e. Double swing doors are considered to be dangerous for school use.

f. Shops which require a grade entrance should be provided with overhead doors at least 8 feet wide. In this case, a standard single door to the corridor is satisfactory. Shops without a grade entrance should be provided with double width entrance doors to the corridor for the installation of machinery and equipment.

g. Doors to built-in cabinets should, if possible, be full length. Half length doors are a frequent source of accident unless protected by a projecting deck underneath extending the full swing of the door.

120. CORRIDORS

a. By their very shape, corridors have a tendency to build up and carry sounds like speaking tubes. To reduce as far as possible the noise of corridor traffic, acoustical material may be used to absorb sound and reduce reverberation. Corridors should be provided with adequate natural light if at all possible.

b. Objects that project into a corridor tend to impede the smooth flow of traffic. For this reason, drinking fountains, display cases and pedestals, stairways and steps, classroom doors at the end of their swing should not be permitted to extend into the passageway more than a few inches. Any sudden reduction in corridor width is likewise an obstruction and should be avoided.

c. As a general rule, secondary schools because of the greater demands occasioned by frequent mass travel between classrooms and the use of corridor lockers, require wider corridors than do elementary schools. Although proper width is proportional to the size of the school, the length of corridors and the number of classrooms they serve, it should be borne in mind that most schools are eventually enlarged. It is generally good policy to oversize school corridors in anticipation of a future expansion.

121. STAIRWAYS

a. Stairways should provide for convenient vertical circulation for all normal school requirements. They should be so related to school activities and to each other that traffic will be evenly divided and distributed from floor to floor.

b. In addition they should provide safe and rapid means of egress from the building in case of fire or panic. This means that stairs should lead directly to the out-of-doors, and be so located as to prevent all possibility of pupils being trapped.

c. Special consideration should be given to heights of handrails and safety type treads.

122. EXITS AND ENTRANCES

a. Exits properly located and of sufficient number and width are necessary to provide means of safe and rapid emptying of the building even if one or more avenues of escape may be blocked. Exits leading directly from stairways, doing away with the need for re-entering corridors, promote safety.

b. Where schools are situated in congested areas or on busy thoroughfares, proper locations of entrances and exits will provide greater safety from vehicles for pupils coming to and leaving the building in large groups.

c. Areas of concentrated occupancy such as auditoriums, assembly halls, gymnasiums, cafeterias, etc., require special consideration. They should be near ground level with exits leading directly to the out-of-doors rather than into the body of the building.

EXITS AND ENTRANCES (Cont'd)

d. Where auditoriums, gymnasiums, etc., are used for community purposes, it is desirable that entrances be arranged without allowing access to the rest of the school.

123. ACOUSTIC TREATMENT

The modern school houses a great variety of activities. Every attempt should be made to locate noise-producing activities in areas where the least disturbance is offered to quieter activities. Acoustic treatment promotes efficiency and, like good lighting and sanitation, is no longer a luxury but a necessity.

Acoustic treatment is desirable in various places for various purposes.

a. Corridors: To absorb corridor noises and reduce the transmission of noises from one part of the building to another.

b. Music rooms, typewriting rooms, noisy shops, gymnasiums, playrooms, cafeterias:
To absorb and localize noise in the area in which it is produced and to reduce noise effects within the areas themselves.

c. Auditoriums, libraries and study rooms:
To promote good audition and the elimination of distractions.

If finances permit, acoustic treatment is desirable for all pupil spaces within the building. If some spaces must be neglected, the Board together with the architect should decide upon the areas which should be given preference.

124. FLOORS

a. The type of floor surface selected is most important. It should be easily cleaned, have good traction and acoustic qualities and in places where equipment must be fastened, it must offer a ready and secure anchorage. Permanence, cleanliness, and light colour should also be considered.

b. The type of floor surface for various spaces is suggested as follows.

Elementary Schools, Item 205 - 224.
Secondary Schools, Item 305 - 354.

c. In cases where wood floors are used, oil finishes are not recommended. Such finishes present a fire hazard and tend to collect and retain dirt. Special finishes are available which are hard, durable and dust resistant. Where concrete floors are used they should be treated with an integral hardener and finished smooth.

d. Boards are advised to take such action as may be recommended by the architect for the care and preservation of floors.

125. LOCKERS & WARDROBES

a. From both social and purely practical points of view every pupil requires suitable space for the safe, tidy and convenient storage of personal belongings.

b. The establishment of cloak or locker rooms is not recommended. Such areas are difficult to supervise.

c. Wardrobes installed within the classroom constantly under teacher supervision are generally satisfactory for elementary schools.

d. Individual full-length lockers set flush in the corridor walls are recommended for secondary schools. Precautions should be taken that the installation is sound-proofed against transmission of sound to adjacent classrooms.

e. Both lockers and wardrobes should be well ventilated.

126. CHALKBOARDS AND TACKBOARDS

a. Tackboard space is becoming more important than chalkboard space. The required amount of space for chalkboards and tackboards is shown as follows.

Elementary Schools, Items 205 - 214.
Secondary Schools, Items 305 - 341.

b. In most classrooms, after the requirements for chalkboards, built-in cupboards, etc., has been met, it is generally desirable that the remaining wall surface take the form of tackboards.

c. First quality black slate has been considered the best chalkboard material. Other materials are gaining favour but should not be purchased unless they are known to be satisfactory. Light-coloured surfaces combined with dark chalk affords better seeing conditions. The matter of permanence together with easy clean erasure should be carefully investigated and compared with black slate.

d. Chalkboards should be provided with chalk troughs which will keep both chalk and erasers out of chalk dust.

e. It is desirable that chalkboards be provided with an independent means of artificial illumination.

f. Cork is the most satisfactory material for tackboards. The expense involved forces consideration of less expensive materials such as various fibre boards.

127. SCREENS AND GUARDS

a. Insect screens should be provided on the exterior openings of all places where food is prepared or served.

b. Wire guards may be required on gymnasium and playroom windows and electric fixtures. They should be readily removable to permit cleaning.

128. BUILT-IN FURNITURE AND EQUIPMENT

a. Certain items of equipment and furniture should be built-in and become a permanent part of the building. This promotes convenience and efficiency in the various spaces concerned and in addition contributes to orderly appearance and good housekeeping habits which are most desirable.

b. Every attempt should be made to anticipate the need and the location of such furniture and equipment. It is better to be omitted if it is not suitable or if there may be some likelihood that the location may prove to be unsuitable.

c. In classrooms built-in fixtures are best located along the corridor wall. This leaves an opportunity for the walls between classrooms to be readily removed if future remodelling becomes necessary.

d. While ample storage space is a general requirement chalkboard, tackboard and windows all require wall space. If needs are sufficiently pressing, doors to built-in cabinets can be finished with suitable tackboard surfacing.

e. Teachers' cupboards may be required in classrooms for the storage of coats, wraps and personal effects. It is more desirable to provide such facilities in the teachers' rooms.

f. Careful arrangements should be made for the installation of cabinets and furniture which require connection to water, gas, drains, power, ventilation, etc. In most cases standard furniture is desirable and provision should be made for its installation within the building contract. The Board should reserve the right to purchase such furniture and equipment directly from school supply houses.

g. In general, built-in furniture is not desirable in shops. Tool cribs are not necessary since it is better to decentralize the tools, supplies, etc., and keep them adjacent to the machines and processes concerned in suitable movable cupboards.

h. Furniture of any kind, standard or built-in, should be simple and rugged in character. Adjustments, loose pieces, superfluous racks, shelves, drawers, etc., should be avoided wherever possible. Ease of maintenance and cleaning is an important consideration.

i. Display cabinets built flush into the corridor walls strategically located throughout the school serve a most useful purpose. They may be used for trophies, club activities, sewing, social studies, crafts, art, shopwork, etc.

Such cabinets should be provided with sliding plate glass doors, adjustable glass shelves, backboard on which displays can be mounted, and provided with a lock. Cabinets should be illuminated with fluorescent light (50-foot-candles) and so arranged that observers will not be subjected to glare.

129. MUSEUM SERVICE

a. The Extension Division of the Royal Ontario Museum is prepared to furnish schools with educational displays. Schools wishing to take advantage of this service should provide one or more built-in display cases in the corridor, as mentioned in Item 128, i, for this purpose. The museum authorities suggest that the size of cabinets required should be 6'-0" wide, 4'-0" high, 1'-3" to 1'-6" deep. The bottom of the cabinet should be 2'-0" above the floor level.

b. Additional displays designed to suit different classroom activities can also be made available. These displays can be accommodated in small free standing cabinets. Recessed or built-in display cabinets are not required for this purpose.

130. FINISH AND DECORATION

a. Rooms, shops and other spaces within the school should present suitable practical surfaces decorated in attractive colours.

b. Appropriate finishes are available for almost any purpose. The increasing use of tackboard in place of chalkboard area in itself serves to brighten up rooms and at the same time is of some acoustic value.

c. There is no reason why some drab colour should be standard for an entire school. In general, warm colours are suitable for northerly rooms and the cool colours for southerly exposures. The various departments in a school might easily be distinguished by different colours.

d. Ceilings should have a high light-reflecting value. Walls should be finished in non-glossy light tints. Where soiling becomes a factor darker colours may be used for wainscotes and limited areas. All surfaces should be readily cleaned.

e. Wood trim and furniture should be finished in lighter tones if a varnished finish is desired. It is quite possible that the trim may be painted or enamelled.

f. Smooth finish brick may be used for wall surfaces in shops and other practical areas.

131. FLAGPOLE

All schools should be provided with a suitable flagpole. In general a pole attached to the building is unsatisfactory. A pole on the school grounds is more convenient and is more appropriate for ceremonial purposes.

132. BICYCLE STORAGE

a. It is no longer feasible to provide space within school buildings for bicycle storage.

b. A simple type of picket fence is generally satisfactory. It is preferred that such a rack should not be too permanently anchored, since it often becomes necessary to move the entire bicycle rack to another location. A canopy over the rack is not required.

133. TEMPORARY ACCOMMODATION

a. It is a good policy to anticipate school requirements and make the necessary arrangements for permanent school accommodation. Sudden growths, population shifts and market conditions sometimes require the provision of temporary accommodation.

b. Temporary accommodation is not at all desirable and it should be so placed on the site as not to interfere with permanent building operations.

c. Temporary accommodation is likely to cost from one-quarter to one-half the amount of permanent accommodation. It cannot be considered as a good investment. In addition, maintenance and operating costs are likely to be excessive.

d. If at all possible, finances for such temporary structures should be arranged out of current revenue. If debentures are required they should be retired in 5 years or less.

e. Approval for temporary accommodation should be secured from the Department before commitments are made.

134. ADMINISTRATION BUILDINGS

a. Large school systems may find that a centralized administration building would promote efficiency and economy. If the need for the establishment of such a building can be shown it may be considered.

b. Such a building might include space for school administrators, board room, general office space, storage and maintenance quarters, and garage. It should serve the needs of both elementary and secondary schools in the municipality concerned.

135. HOUSING FOR STAFF

a. In some rural areas, it may be necessary to provide housing. In this event consideration may be given to the establishment of suitable quarters built on the school site.

b. The cost of such accommodation should be separated from the school building contract and arrangements made for the payment of rent by the tenants which will reimburse the Board for the cost of the accommodation and any other services rendered.

136. THE SCHOOL AS A COMMUNITY CENTRE

a. There is a growing demand that schools be used as community centres, thus extending the service which may be secured from the investment of public funds.

b. The full use of all educational facilities for regular night school work has been practised by many schools with excellent results. Any extension of this work should be encouraged.

c. The dual use of the school and grounds is most desirable. Many of the facilities set up for the pupils can be used more extensively by the community at large.

d. It is important in the development of such a plan that community centre considerations do not take precedence over school requirements to the detriment of pupil use.

e. It should be noted that one of the main arguments for the use of the school as a community centre is that idle school space will be used for a greater amount of time. It would be unfortunate if enthusiasm for community centres resulted in the addition of further spaces for limited use. This would mean the establishment of a situation similar to the one which it is hoped to rectify.

f. It is suggested, therefore, that every advantage be taken of those school facilities which can be used for a community centre. If facilities are set aside for the express use of a community centre or if the school facilities are enlarged or equipped over and above requirements of the pupil body then such expense cannot be considered as a legitimate charge against education.

g. When encouraging the use of school facilities for community purposes, it is necessary to make sure that this use will not disturb or endanger the efficient administration of the school. Careful consideration must be given to the means of entrance to the auditorium, gymnasium, cafeteria, playing fields, etc., and the probable use to which these quarters may be put together with their associated areas and equipment.

137. SALE OF SCHOOL BUILDINGS AND EQUIPMENT

a. All revenue derived from the sale or transfer of school property must be applied to school purposes in accordance with the provisions of the governing school Acts.

b. As legislative grants on school buildings and equipment may be affected by the revenue thus received, the Department should be consulted before any such sale or transfer is undertaken.

138. INSURANCE

a. Boards have the power to insure school buildings and equipment. It is strongly urged that Boards exercise this power.

b. Any revenue from this source must be applied towards the replacement of the insured buildings or equipment or other approved capital expenditure.

c. During building construction operations, the Board should be guided by the architect with respect to the placing of insurance to protect the Board's interest.

139. TRANSPORTATION

a. In some school districts it is necessary to provide transportation which usually takes the form of a school bus.

TRANSPORTATION (Cont'd)

b. In most cases a contract can be arranged with a commercial transportation company. There may be some rural districts where commercial companies cannot operate economically. In this case the Board may be required to provide its own transportation system.

c. The school bus if owned by the Board is generally stored in a fenced section on the school site. It may be desirable to provide suitable garage accommodation, which may be attached to the school or built as a separate building. If a garage is attached to the school it should be partitioned off by adequate fire walls. Direct access or openings of any kind to the school from a garage should not be permitted.

d. The Department of Highways with the approval of the Ontario Municipal Board issue "School Bus Licenses" at no charge subject to the following conditions.

1. If the vehicle is more than 3 years old, or if it has been subjected to structural change, a complete description of the vehicle, including its road worthiness, must be submitted to the Department of Highways by the local representative of the Provincial Police.

2. The vehicle must be covered by insurance for passenger hazard, public liability, and property damage, in accordance with the regulations under "The Public Vehicle Act."

3. The driver must hold a chauffeur's license.

Boards should familiarize themselves with the complete regulations.

140. MAINTENANCE

a. Apart from the general caretaking of the building and grounds, it is essential that both be kept in a good state of maintenance and repair.

b. The structure and mechanical equipment as turned over to the Board by the architect offers certain services and conveniences which will retain their value if given adequate attention.

c. The effect of the wear and tear of the elements on the exterior and the normal wear and tear on the interior require constant attention.

d. Mechanical equipment, plumbing, heating, ventilating, lighting, etc., will continue to perform their function efficiently if repairs are effected when required. The practice of modifying or discontinuing the use of equipment which serves to protect the health and safety of the occupants should not be considered unless competent advice is secured. Alterations which might interfere with safety and health features originally placed in the building should not be permitted.

e. Playing grounds should be kept in a good state of repair. Hazards even of a temporary character should be avoided.

141. BOILERS AND PRESSURE VESSELS

All equipment of this character must be installed to meet with the approval of the Boiler Inspection Branch of the Department of Labour. Such equipment once installed must be maintained in safe operating condition which may be assured in one of two ways.

a. Carry insurance on such equipment in which case the insurance company will make arrangements for periodic inspection and certification. This course is recommended.

b. In the case of uninsured equipment, it is obligatory that the equipment is periodically inspected and certified by the Boiler Inspection Branch of the Department of Labour.

In any case, the approved pressures should not be exceeded nor should safety devices be modified or interfered with in any way.

142. SAFETY

a. Although every precaution is taken to provide safety within school buildings, there is the continual hazard that the original equipment through constant use may become dangerous. It is also possible that the introduction of new equipment might set up dangerous situations. Apart from fire, health and electrical dangers, there are other dangers of a mechanical nature which may cause concern. This is particularly true in shops and vocational schools.

b. The Factory Inspection Branch of the Department of Labour may upon invitation make a survey of shop conditions in schools and make recommendations regarding safety devices and safe working conditions.

c. The Safety Accident Prevention Association maintains a bulletin service which is available to all schools. These bulletins cover all phases of accident prevention. They are well illustrated and provide much useful information for safety education. Their use is highly recommended.

d. An element of danger is always present particularly in shop activities. Some schools have gone to the extent of carrying accident insurance.

SUGGESTED REQUIREMENTS
for
ELEMENTARY SCHOOLS

NOTE: Refer to Items 100 to 142 for "General Considerations"

200. SITE

It is becoming increasingly difficult to find sufficiently large sites in urban centres. In special circumstances, the Department may give consideration to sites smaller than those indicated. Some Boards have made arrangements with municipal park authorities for the use of park lands adjacent to sites for playground purposes. The following areas are suggested for elementary school sites:

up	to	100	pupils	1½	to	2	acres
"	"	200	"	2	"	3	"
"	"	300	"	3	"	4	"
"	"	400	"	4	"	5	"
"	"	600	"	5	"	6	"
"	"	800	"	6	"	7	"
"	"	1000	"	7	"	8	"

Refer to Item 101, "Selecting the Site."

201. CAPACITY OF THE SCHOOL

a. It is generally conceded that the maximum enrolment in grade-rooms should not exceed 35.

b. The enrolment in kindergartens, homemaking, and industrial arts and crafts should not exceed 20.

c. Variations in the sizes of classes contribute to administration difficulties which may be overcome in part by planning all grade classrooms for 40 pupils and kindergartens, homemaking and industrial arts and crafts rooms for 20 pupils.

d. The capacity of the school for efficient operation may be computed as follows:

1. All classrooms including special rooms for library classrooms, art, music, audio-visual aids, etc. 35 pupils
2. Homemaking rooms, Industrial Arts and Craft rooms 20 "
3. Kindergarten rooms occupied full time by one class 20 "
4. Kindergarten rooms occupied half time by one class 40 "
5. Playrooms provide some instructional accommodation but they should not be charged to pupil load.

202. INSTRUCTIONAL AREAS

a. Instructional areas are those which carry a classload and are devoted to actual instructional work, viz., regular classrooms, kindergartens, library classrooms, rooms for art, music, audio-visual aids, homemaking, industrial arts and crafts, playrooms, etc.

INSTRUCTIONAL AREAS (Cont'd)

b. The following general suggestions are made. Modifications should be made to suit local conditions. Detailed suggestions are made in Items 205 to 214.

c. Areas

1. Unless otherwise noted the area shown for classrooms will accommodate 40 pupils.

2. Kindergartens, Homemaking, and Industrial Arts and Crafts rooms will accommodate 20 pupils.

3. Unless otherwise noted an allowance is included in each area for the necessary storage of supplies and equipment.

d. Widths

Unless otherwise noted a minimum width of 23 feet is suggested for all instructional areas.

e. Ceiling Heights

1. A ceiling height of 9 to 12 feet is suggested for most instructional areas. A height of 12 feet is recommended for industrial arts and crafts room. Playrooms should have a ceiling height of 14 to 16 feet.

2. Particular care should be taken in designing artificial lighting where ceilings are lower than 10'-6".

3. Window heads should be kept as high as possible.

f. Layouts

1. The Board, Principal, Inspector, and supply houses should collaborate and furnish the architect with room and shop layouts in order that the necessary utilities can be properly located and built in for the installation of equipment.

2. This information should be available to the architect well in advance of construction, otherwise he will be obliged to use his discretion with respect to locating utilities and fixed equipment.

203. AUXILIARY AREAS

Auxiliary areas are those not designated as instructional areas but are necessary to make the school function as a whole. They provide for the following:

a. Administrative Offices, Teachers' Rooms, Student Supply rooms.

b. Health Service, Vocational Guidance or Counselling Offices.

c. Auditoriums (with fixed seats), stage, dressing and property rooms.

d. Lunch rooms, Kitchens.

e. General Storerooms, Boiler rooms, Maintenance and Caretaker Quarters.

f. Washrooms and Toilets for staff and pupils.

g. Corridors, stairwells, entrances, and other structural requirements.

AUXILIARY AREAS (Cont'd)

The size, variety, and appointment of such spaces depend upon the size of the school and the services which the school proposes to offer.

It should be noted that playrooms are not classed as auxiliary areas, since some instruction in physical education may be given.

204. FURNITURE & EQUIPMENT

a. The cost of furniture and equipment varies considerably. It is essential that Boards make careful investigations with supply houses and compile equipment lists for approval by the Department before commitments are made.

b. Estimated amounts for furniture and equipment are indicated as follows:

Instructional Areas, Item 205 to Item 214
Auxiliary Areas, Item 215 to Item 224

205. CLASSROOM

Location: Removed from noisy activities.
Floor Area: 750 to 900 sq. ft. Min. 19 sq. ft. per pupil
Floor Surface: Linoleum, Asphalt Tile, Hardwood
Convenience Outlets: Two, one at each end of room
Light Intensity on Desks: 20 to 30 foot-candles
Chalkboard: 60 sq. ft. Tackboard: 90 sq. ft.
Furniture & Equipment: $800.00 to $1200.00

a. In elementary schools the classroom is generally the home room. Variations in the appointments are required to suit the grade concerned.

b. If the school has more than one storey, the classrooms for junior grades should be on the ground floor.

c. Wardrobes for pupils' clothing should be provided. They should be built in the back or corridor walls. Cloakrooms are not satisfactory as they make supervision difficult. Wardrobes should be well ventilated.

d. Suitable storage cupboards for classroom supplies and equipment are required. These may be built-in (Item 128), or they may be self-contained.

e. A cupboard for the teachers' personal effects should be provided unless such accommodation is provided in the teacher's room.

f. Provision for project work should be made. An area of 100 to 200 sq. ft. is necessary. This amount is included in the floor area already mentioned.

g. The project area should include a bench with cupboards above and below for the storage of tools and materials. A sink built into the deck may be desirable. The project area may extend across the back of the room or it may take the form of an alcove. It must be capable of easy supervision. The practice of enclosing the project area is not recommended.

CLASSROOM (Cont'd)

h. Particular attention should be given to the sizes and heights of chairs, desks, tables, chalkboards, tackboard, project benches, wardrobes, etc. These sizes vary according to the grade concerned. It might be noted that furniture which was properly sized for a given grade 20 years ago is now being replaced with larger units. It may be advisable to equip each room with about 10% oversize and 10% undersize desks to take care of the proportion of the largest and the smallest pupils found in most classes.

i. Provision should be made to darken a few strategically situated rooms for the use of projectors and delineascopes.

206. KINDERGARTEN ROOMS

Location: Removed from classrooms
Floor Area: 700 to 800 sq. ft. Min. 35 sq. ft. per pupil
Floor Surface: Linoleum, Asphalt Tile
Convenience Outlets: 4
Light Intensity: 20 to 30 foot-candles
Furniture and Equipment $800.00 to $1200.00

a. Such rooms may be established as junior, senior or primary kindergarten rooms. The area shown will provide accommodation for 20 pupils. The room should be equipped and appointed for the class concerned. Some rooms may serve one class in the morning and another type of class in the afternoon. Accordingly, the equipment in use for the morning class would have to be supplemented for the afternoon class. In some cases, two classes may be placed in the one room. This means that the area required would be double that shown. The following suggestions apply to a typical room intended for one class at any one time:

b. Main Room

1. The area shown is required for general pupil activity. Additional space is necessary for coat rooms, washrooms, vestibule and kitchenette.

2. Good natural lighting is most desirable. A south or south-east exposure is favoured. The room should be bright and cheerful, and decorated to make pleasant surroundings for the pupils.

3. Kindergarten rooms, especially in large schools, should be self-contained. Precautions should be taken to avoid the disturbing influence of older pupils. Stairs, long corridors, and unnecessary doors should be avoided as they increase supervision.

4. The floor may be inset with suitable motifs or designs. Precautions should be taken to insure a warm, readily cleaned surface which is relatively free of draughts.

5. Benches should be provided along the walls sufficiently low for the pupils to sit on. Storage cupboards which can be locked may be placed under the seats. Further storage space for equipment and supplies may take the form of shelves, cupboards, etc., which may be independent or built-in.

KINDERGARTEN ROOMS (Cont'd)

b. Main Room (Cont'd)

6. A portable chalkboard is required for most rooms. If the room is to be used exclusively for the primary class, a fixed chalkboard (45 sq. ft.) should be provided. Abundant tackboard is desirable in all rooms.

7. It may be desirable to provide means of darkening the room for the use of a projector or delineascope.

8. A low drinking fountain should be installed in each kindergarten room.

c. Coat Room

A coat room which may be readily supervised from the main room should open off each kindergarten room. Low hangars which may be in ventilated wardrobes are suitable for storage of clothing.

d. Washrooms

A washroom for each sex should be provided for each coat room. Each washroom should include one water closet and one hand basin. Two of each of these fixtures would be desirable. Small size fixtures are necessary. Drinking fountains should not be installed in washrooms.

e. Kitchenette

A small kitchenette equipped with sink, hot plate, and a suitable work bench with cupboards above and below for supplies dishes and utensils is necessary. It may take the form of an alcove off the main room. If more than one kindergarten room is involved, the kitchenette may be a common area.

f. Entrance

Entrance should be from the playground area via vestibule to coat room and thence to the main room. The vestibule should contain built-in cupboards for playground equipment. A low drinking fountain may be installed in the vestibule or at some other point readily accessible to the playground area.

g. Playground Area

A playground area should be provided for the sole use of kindergarten pupils. An allowance of 2000 sq. ft. for each room is suggested. The area should be fenced off from the remainder of the school grounds by a hedge or shrubbery. It is desirable that kindergarten pupils may enter this area directly from the sidewalk without crossing the general playgrounds. Most of the area should be sodded. Part of the area should be hard-surfaced and a small plot set aside for digging and planting.

207. LIBRARY (Large Schools)

In very large elementary schools a library classroom may be established.

LIBRARY (Cont'd)

Location: Quiet, central, adjacent to classrooms
Floor Area: 800 to 1000 sq. ft. Min. 20 sq. ft. per pupil
Floor Surface: Linoleum, Asphalt Tile
Convenience Outlets: 4
Light Intensity on Tables: 20 to 30 foot-candles
Chalkboard: 60 sq. ft. Tackboard: 30 sq. ft.
Acoustic Treatment: Sound absorptive ceiling desirable
Furniture, Equipment, Initial Books: $1000.00 to $2000.00

a. Adjustable bookshelves, map files, magazine racks, etc., should be built into all available wall space.

b. The furniture should consist of movable library tables and chairs and the necessary filing and record cabinets.

c. The books and texts in general use for classroom work should be kept in the classrooms of each grade rather than in the central library.

d. If the library is to be used as a home classroom, wardrobes (Item 205, c) should be installed.

e. The Project area (Item 205, g) should be omitted.

f. The normal facilities of the school library may be made available to the public. It is not necessary, however, that the school library be enlarged or equipped to function as a public library.

208. LIBRARY (Medium and Small Schools)

It is desirable that library accommodation be established in all schools. In the very small school such accommodation may take the form of one or two bookcases in one of the regular classrooms or in an office or supply room. If at all possible a small room 200 to 400 sq. ft. should be set aside as a central library. It should be furnished and appointed as suggested in Item 207.

209. ART ROOM

Instruction in arts and crafts is usually carried on in the project areas in each classroom. This is supplemented by further instruction in schools where industrial arts and craft rooms and Home Economics rooms are established. Only very large elementary schools with a rotary system in the senior grades should consider the establishment of an art room. The size and appointments of such room are outlined in Item 307.

210. MUSIC ROOM

Instruction in music is usually carried on in the regular classrooms. Only very large elementary schools with a rotary system in the senior grades should consider the establishment of a music room. If such a room is justified the following suggestions are made:

MUSIC ROOM (Cont'd)

Location: Remote as possible from classrooms and administration quarters, near stage if possible
Floor Area: 750 to 900 sq. ft. Min. 19 sq. ft. per pupil
Floor Surface: Linoleum
Convenience Outlets: 4
Light Intensity: 20 to 30 foot-candles
Chalkboard: 60 sq. ft. Tackboard: 60 sq. ft.
Acoustic Treatment: Essential walls and ceiling
Furniture & Equipment: $1000.00 to $2000.00

a. If the music room is to be used as a home classroom, wardrobes, (Item 205, c) should be installed.

b. The Project Area (Item 205, g) should be omitted.

c. This room may be combined with an audio-visual room (Item 211). If the rooms are combined, the size as described would be satisfactory.

d. Suitable storage cupboards for supplies and instruments should be provided.

e. A good ground and aerial should be provided for a radio receiver.

f. Provision should be made for a record player and suitable record cabinets.

211. AUDIO-VISUAL EDUCATION ROOM

Visual education has always been an integral part of the educative process. Modern developments in the way of projectors, delineascopes, and film libraries have progressed to the point where provision for their use cannot be ignored.

Illustrative material to be effective should be used for the subject concerned at the proper time and place. This is best accomplished by making provision for the darkening of a few strategically situated rooms.

Provision for large groups can usually be made by using playrooms, assembly rooms or lunch rooms.

The designation of a special room for audio-visual education is of doubtful value. It should be considered only in very large schools which have a rotary system in the senior grades. It may be combined with a music room (Item 210). Should an audio-visual education room as such be established the following suggestions are offered.

Location: Adjacent or combined with Music room
Floor Area: 750 to 900 sq. ft., Min. 19 sq. ft. per pupil
Floor Surface: Linoleum
Convenience Outlets: 4
Light Intensity: 20 to 30 foot candles
Chalkboard: 60 sq. ft. Tackboard: 60 sq. ft.
Acoustic Treatment: Desirable
Furniture & Equipment: $1000.00 to $2000.00

a. If the audio-visual education room is to be used as a home classroom wardrobes (Item 205, c) should be installed.

b. The Project Area (Item 205, g) should be omitted.

AUDIO-VISUAL ROOM (Cont'd)

c. Provision should be made for both film and sound, moving and slide film projectors, and delineascopes.

d. Suitable cupboards should be provided for the equipment. Steel cabinets should be used for film storage.

e. Effective darkening arrangements are essential.

212. GENERAL HOMEMAKING

Home Economics may be offered as an optional subject in Grades VII and VIII in elementary schools. The facilities required may vary depending upon the size of the classes and the percentage of time such facilities would be in use. The following suggestions are made:

a. Combined Attendance by Elementary and Secondary Pupils

In cases where a full class load will be in attendance most of the time, a general homemaking room as described in Item 312 is necessary. The room may be in an elementary school and provision made for secondary pupils to attend. The reverse may be true and the elementary pupils would attend the secondary school for this subject. Boards should make careful investigation in order that rooms may not be idle a part of each week.

b. Full Attendance by Elementary Pupils

In cases where a full class load from one or more elementary schools will be in attendance most of the time, a general homemaking room as described in Item 312 is necessary. While the course of study in homemaking varies for elementary and secondary schools, the equipment and space required for each type of school is much the same.

c. Part Time Attendance

In small schools where the small enrolment of girls in Grades VII and VIII limit the full use of the general homemaking room, consideration should be given for economic reasons to a reduction in the size of the room and the amount of equipment. In very small schools an area of 150 to 300 sq. ft. may suffice. It should be attached to a regular classroom and arranged to permit ready supervision by the classroom teacher.

213. INDUSTRIAL ARTS AND CRAFTS ROOM

A shop for this subject may be required for grades VII and VIII in elementary schools. The facilities required may vary depending upon the size of the classes and the percentage of time such facilities would be in use. The following suggestions are made:

a. Combined Attendance by Elementary and Secondary Pupils

In cases where a full class load will be in attendance most of the time a General Shop as described in Item 324 is necessary. The shop may be in an elementary school and provision made for secondary pupils to attend. The reverse may be true and the elementary pupils would attend the secondary school for this subject. The Board should make careful investigation in order that rooms may not be idle a part of each week.

INDUSTRIAL ARTS AND CRAFTS ROOM (Cont'd)

b. Full Attendance by Elementary Pupils

In cases where a full class load of elementary pupils from one or more elementary schools will be in attendance most of the time, an industrial arts and crafts room should be established. The following facilities are suggested:

1. Location: Removed from classrooms
Floor Area: 1000 to 1200 sq. ft. Min. 50 sq. ft. per pupil
Floor Surface: Hardwood, Asphalt Tile
Washing: Wash Tray for 4 pupils
Gas: Desirable
Convenience Outlets: 4
Light Intensity: 20 to 30 foot-candles
Chalkboard: 30 sq. ft. Tackboard: 30 sq. ft.
Furniture & Equipment $2000.00 to $3000.00

2. The room should be equipped with benches and a full range of hand tools for industrial art and craft work. Power driven machines are not desirable.

3. Self-contained cupboards, racks, bins, etc., are suitable for the storage of tools and supplies which should be kept adjacent to the various crafts concerned. Enclosed areas for painting and storage are not desirable, since they increase supervisory problems.

c. Part Time Attendance

In small schools where the small enrolment of pupils limit the full use of the industrial arts and crafts room, consideration should be given for economic reasons to a reduction in the size of the room and the amount of equipment. In very small schools an area of 150 to 300 sq. ft. may suffice. It should be attached to a regular classroom and arranged to permit ready supervision by the classroom teacher.

214. PLAYROOMS

Location: Removed from classrooms
Floor Area: As noted in Item b.
Floor Surface: Linoleum, Asphalt Tile, Hardwood
Ceiling Height: 14 to 16 feet
Light Intensity: 20 to 30 foot-candles
Chalkboard: 15 sq. ft. Tackboard: 15 sq. ft.

a. Playrooms are essential. It is desirable that separate rooms or areas be provided for boys and girls. The accommodation varies according to the size of the school concerned. In schools with a pupil body of less than 1000, it is usually necessary to make dual use of the playroom floor for auditorium purposes. The following accommodation is suggested:

b. 1. Small Schools

The small school may be forced to forego a specially designated playroom area. In some cases provision may be made for increasing the size of the corridor or entrance for use as a playroom. Some schools use some of the classrooms for playrooms. Movable partitions, folding doors, etc., may be used to separate 2 classrooms or a classroom and corridor or entrance, etc. These various expedients are not desirable, but may be justified for economic reasons.

PLAYROOMS (Cont'd)

b. 2. Schools from 100 to 150 Pupils

One common playroom 1000 sq. ft. (Will seat 150 as Assembly Hall)

Small platform 100 to 200 sq. ft. in addition

Chair Storage essential

3. Schools up to 300 Pupils

Two playrooms 1000 sq. ft. (One boys' and one girls')
These rooms may be divided by folding doors and will seat 300 if used jointly for an Assembly Hall. A stage 12 feet deep with a forestage 4 feet deep should be added. Chair storage is essential.

4. Schools up to 500 Pupils

Two playrooms 35' X 50' or 1750 sq. ft. (One boys' and one girls'). These rooms may be divided by folding doors and will seat 500 if used jointly for Assembly Hall purposes. A stage 15 feet deep with a forestage 4 feet deep should be added. Chair storage is essential.

5. Schools over 500 pupils

Schools over 500 pupils may add additional playrooms, refer to Item 109, a, for maximum number of movable seats.

c. Playrooms which are to be used for Assembly Halls should be primarily designed and appointed as playrooms. Special attention should be given in order that these rooms may be rapidly and easily converted from one purpose to the other.

d. Good natural light is essential. It is desirable that there be windows (high up) along at least one of the long walls. Good general ventilation is required. It is important that walls should be free of all projections for a height of 8 feet. All doors should open out. Acoustic treatment of the ceiling may be desirable.

e. Playrooms are not intended to serve as gymnasiums. Dressing, shower, and apparatus rooms are not required.

f. When playrooms are used for Assembly Hall purposes, it is important that they be located and arranged for convenient and safe means of entry and exit.

g. The cost of equipment and furnishings for Assembly Hall purposes can vary widely. For items not usually included in the building contract allow from $6.00 to $10.00 per person of seating capacity.

h. The use of the Assembly Hall for community purposes should be encouraged. It is desirable that it be readily isolated from the rest of the school. An independent means of entrance may be considered. If the school has a lunch room, it should be adjacent to the assembly hall, if possible. Separate toilet accommodation for adults is most desirable.

i. If community centre interests demand larger quarters, appointments, and facilities which are not normally required for pupil use, the expense involved cannot be charged to education.

215. HEALTH SERVICES

a. Boards wishing to introduce health services in schools should approach the local Board of Health. Provisions whereby such services may be supplied are set out under appropriate sections of "The Public Health Act." Agreements are required, particularly where payment of special grants is dependent upon the extension of available public health services by Boards of Health to schools.

b. If an agreement is reached with the Board of Health, school authorities should provide suitable space in the school concerned and the necessary fixtures and furniture. Medical and nursing supplies and equipment required for the rendering of these professional services associated with presently recognized school health programmes are usually conceded to be the responsibility of the official health agency, the Board of Health. It is most desirable that health service quarters be set up in a central location preferably adjacent to the general office.

Good natural light and ventilation are most desirable. Convenience outlets are required in all spaces except the washroom. Sanitary finishes without a hospital atmosphere are most desirable. It is suggested that the floor be linoleum or asphalt tile.

c. Small schools may set up a small room for a school nurse. This room should be about 150 square feet. One section should be equipped with a wash hand basin, cupboard, desk, chairs, table, etc. The other section should be set aside as a rest cubicle and furnished with a proper hospital bed.

d. Larger schools may wish to expand the accommodation mentioned above and include a waiting room, small dressing room with toilet, hand basin and clothes closet and an additional rest cubicle. In this case, the area required would be 300 to 400 sq. ft.

e. Schools wishing to offer full health services, viz., doctor, dentist, and nurse, would have to provide approximately 700 to 800 square feet of space.

It should be divided to provide a common office for the doctor and dentist, and nurse's quarters. Each of these spaces require a hand basin. The common office should be provided with plumbing connections for the dentist chair.

A general waiting room with a washroom including toilet, basin, and clothes cupboard is necessary.

The remaining space should be divided into as many rest cubicles as possible. A 20-foot distance is required for eye-testing.

f. The cost of the furnishings not included in the building contract may run from $600.00 to $800.00 for the full suite as outlined in Item e.

216. VOCATIONAL GUIDANCE

a. Every teacher within a school does a considerable amount of counselling or guidance. The value of this service has grown to the point where it has become desirable to set up facilities for this purpose.

VOCATIONAL GUIDANCE (Cont'd)

b. In small schools, it may be necessary to conduct this work in the regular classrooms or in other suitable spaces.

c. In moderate or larger size schools special provision may be made for a guidance suite consisting of a small waiting room and one or more private counselling offices. The suite should be located near and, if possible, have access to the general school office.

d. Depending upon the number of small counselling offices an amount of $400.00 to $800.00 should be allowed for furnishings and equipment.

217. ADMINISTRATIVE OFFICES

a. The offices should be centrally located with easy access to the main school and to the public.

b. In the small school the office for the principal may be required to provide space for the secretary.

Furnishings and equipment, which should include desks, chairs, typewriter, filing cabinets, and a small safe, may cost from $500.00 to $700.00.

c. In the larger school, the principal should be provided with an office furnished and equipped for efficient administration and to meet students, parents, teachers and public in an appropriate manner. Toilet facilities should be provided.

Furnishings and equipment may cost from $300.00 to $500.00.

A general office should be provided. Its size depends upon the size of the school. There should be access to the principal's office and to the school corridor. It should have a general waiting space separated by a counter. The counter should be provided with suitable shelves and drawers. The waiting space should be furnished with seating, bulletin board, pigeon holes for teachers' mail. The office should be equipped with the necessary typewriters and duplicators, filing cabinets, etc. A suitable vault should be included in the building contract.

The cost of furniture and equipment not included in the building contract varies according to the size of the school. The following allowances are suggested.

1.	For an office with one secretary	$700.00 to $1000.00
2.	For each additional secretary	$200.00 to $ 300.00

218. TEACHERS' ROOMS

These rooms, if they are properly appointed, serve to bring the staff together. They should be provided for both men and women teachers. It is desirable that they be centrally located. The size should be such that 20% to 30% of the staff would find comfortable accommodation. Toilet facilities are essential. Locker or clothes storage should be provided for all members of the staff if such storage is not available in the classrooms.

An allowance of $400.00 to $800.00 should be made for furnishing each teachers' room.

219. CARETAKING AND MAINTENANCE

The caretakers and engineers require certain facilities to carry out their duties effectively.

a. Suitable cupboards and slop sinks should be located on each floor of the building. The cupboards should be large enough to contain the implements required for the floor concerned. If the floor area on any floor exceeds 6,000 square feet, then additional slop sinks should be added for each additional 6,000 square feet.

b. A room centrally located with a grade entrance should be set aside as a receiving room. Adequate equipment should be provided to take care of all shipping and receiving. The outside door to this room should be large enough to permit equipment for the maintenance of the grounds to be stored. A rest room equipped with a toilet and washing accommodation and a hot plate is desirable.

c. If female caretakers are employed, a separate rest room with toilet and washing facilities and a hot plate are necessary.

d. The boiler room should be provided with a substantial work bench and a full range of tools, implements, etc., generally required for the maintenance of mechanical equipment. The engineers should be provided with toilet and shower.

e. Coal bunkers should be arranged so that classes will not be unduly disturbed when the bunkers are charged. Similar precautions should be taken regarding the removal of ashes from the boiler room and from the premises.

f. The cost of the furniture and equipment required for caretaking and maintenance varies according to the size of the school. The following allowances are suggested for those items which are not included in the building contract.

1. For one combined engineer caretaker $300.00 to $500.00.
2. For each additional engineer or caretaker $100.00 to $200.00.

220. SUPPLY ROOM

A supply room for the proper storage of pupils' supplies should be provided in a central location. It should be arranged with shelves and cupboards for the convenient storage of books, texts, paper and general classroom supplies.

The cost of furniture and equipment not included in the building contract - $100.00 to $300.00.

221. STORAGE

a. It is almost impossible to provide sufficient storage space to meet all demands. Storage space is expensive. An adequate amount should be provided, but not for such items which have outlived their usefulness and should be discarded.

b. Storage for classrooms, shops, instructional and administrative areas should be included in the space concerned from a point of view of convenience.

c. Some general storage space is desirable particularly in connection with stages, field stores, caretaking, etc.

STORAGE (Cont'd)

d. Basement storage is of little use due to its inconvenience Such storage might require additional waterproofing, lighting and ventilation which may not be justified for this purpose alone.

222. TOILET FIXTURES

a. The general requirements for washrooms and the class and kind of fixtures are indicated in Items 114 and 115. Toilet facilities for the particular use of kindergartens, craft rooms, homemaking, offices and caretakers' quarters are indicated under the various items concerned.

b. The number of fixtures required for general use by pupils with the exception of the kindergarten is suggested as follows

100 girls	allow	6	water closets,	each additional	100 - 4 W/C
100 "	"	4	hand basins,	"	100 - 1 H/B
100 boys	"	3	water closets,	"	100 - 1 W/C
100 "	"	4	urinals,	"	100 - 3 U/R
100 "	"	4	hand basins,	"	100 - 1 H/B
100 pupils	"	2	drinking fountains	"	100 - 1 D/F

223. LUNCH ROOM AND KITCHEN

a. Urban schools are usually situated so that the pupils may go home for their noon day meal. It is, therefore, unnecessary to provide accommodation and equipment for preparing and serving hot lunches.

b. In some rural schools, it may be necessary to provide some facilities whereby the pupils may have their lunches supplemented by milk, soup or hot beverages. A small kitchen with equipment for this purpose may be established or the homemaking room may be used for this purpose. Lunch room accommodation may be found in some of the classrooms or other areas.

224. AUDITORIUM

a. While the desirability of a well-appointed auditorium is admitted, economic considerations indicate that it is not until the pupil body reaches approximately 1000, that an auditorium as such is feasible.

b. Schools with smaller pupil bodies should consider the establishment of combination playroom-assembly halls, Item 214

c. Where separate auditoriums are feasible they should be built to seat 50% of the pupil body. The following suggestion are made:

d. Seating Space

Area: Allow 7 sq. ft. per person for seating and aisles
Sloping Floor: Linoleum or Asphalt Tile
Seats: Fixed
Galleries: Not desirable, but if used exits at opposite sides
Entrance: Convenient to pupil body, sufficiently large to handle pupil congestion, two ways of corridor approac to entrance in large schools
Exits: Adequate and clearly marked

AUDITORIUM (Cont'd)

Darkening: Readily darkened with draw curtains or shades
House Lights: Switches at entrance. Unless panel box on stage can be reached by lighted passage.
Projector: A booth or place for a portable projector. A speaker cable from projector location to stage. One or two intermediate outlets are sometimes provided.
Vision: Good sight lines or unobstructed vision from any part of the house
Audition: Good audition from any part of the house demands proper acoustic treatment. If the space below or above is used, sound insulation may be required.
Heat and Ventilation: Should be adequate and should be controlled independently of other areas.

e. Stage and Back Stage

Forestage: About 4 feet deep is desirable for speakers and vocalists. Steps either side are desirable for uninterrupted view of pupils called to stage from audience.
Proscenium Arch: At least $\frac{1}{2}$ width of auditorium, 10 to 16 feet high. Height should not exceed $\frac{3}{4}$ of width.
Stage: 3'-4" to 4'-0" high, 20 to 25 feet deep. Floor should be pine, forestage may be hardwood.
Wings: Unobstructed, full width of house, wing galleries 6 feet wide may be desirable
Exits: One each side, one may be a scenery door 8' X 8' to school corridor
Hatch: In roof with fusible link
Controls: All house and stage lights
Cable: To projector include sound
Electrical: Complete gear, spots, floods, dimmers, signals, etc. Footlights may be considered although they are not satisfactory for school purposes. Some other provision for compensating low lighting from the house should be made.

f. Dressing Rooms, Washrooms, Preparation and Rehearsal Space

It is suggested that access from backstage to the school corridor be arranged so that classrooms, and other spaces may become available for rehearsals, dressing rooms, washrooms, and the preparation of sets, etc.

g. Storage

Convenient storage should be provided for the storage of sets, costumes, etc.

h. Cost

The cost of equipment and furnishings for the auditorium and stage can vary widely. For items not usually included in the building contract allow from $10.00 to $20.00 for each person in the audience.

AUDITORIUM (Cont'd)

i. Community Centre

Every effort should be made to encourage the use of the school for educational, social and recreational activities. Reasonable but not excessive amounts might be expended. There is no good reason to compete with reputable commercial interests. Much of the value of a community centre would be lost if it assumed a professional rather than an amateur atmosphere. If community centre interests demand that some further accommodation be added it may be in order to enlarge the auditorium and improve the appointments. The school, however, cannot bear the additional expense involved. Additional features which may be required are suggested as follows.

Separate means of entrance
Adequate lobby or foyer
Ticket Booth
Manager's Office
Washrooms - Men's and Women's
Cloak or Check Rooms
Telephone Booth (pay)
Increased space for scenery, costumes, workshop
Lock up storage for special community effects
Convenient access to cafeteria

j. Should there be a demand for 35 mm projection, it is well to remember that a special booth designed in accordance with the requirements of the "Theatres and Cinematographs Act" and the services of a licensed operator would be required.

SUGGESTED REQUIREMENTS

for

SECONDARY SCHOOLS

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300. SITE

It is becoming increasingly difficult to find sufficiently large sites in urban centres. In special circumstances, the Department may give consideration to sites smaller than those indicated. Some Boards have made arrangements with municipal park authorities for the use of adjacent park lands for playground purposes. The following areas are suggested for secondary school sites.

up to	400	pupils	-	5 to	7	acres
" "	600	"	-	7 "	9	"
" "	800	"	-	9 "	11	"
" "	1000	"	-	11 "	13	"
" "	1500	"	-	13 "	15	"

Refer to Item 101, "Selecting the Site".

301. CAPACITY OF THE SCHOOL

It is generally conceded that class loads in academic work should not exceed 30 (on the average) and in practical work 20 (on the average).

Variations in the number and size of classes coupled with the subjects of instruction which must be fitted into the rotary system, all contribute to administration difficulties.

These difficulties may be overcome in part by sizing all classrooms for 40 and shops and practical rooms for 20.

The capacity of the school for efficient operation may be computed as follows.

a. All classrooms, Science Laboratories, Commercial Rooms, Agricultural Rooms, General Art Rooms, Library, etc: - 30 pupils

b. All General and Vocational Shops, General Homemaking, Clothing & Food Laboratories, Vocational Science, Vocational Art Rooms, etc: - 20 pupils

c. Gymnasiums, Auditorium, Cafeteria provide some instructional accommodation but they are not charged up with a pupil load in order to make an allowance for timetable difficulties.

302. INSTRUCTIONAL AREAS

Instructional areas are those which carry a class load and are devoted to actual instructional work, viz., classrooms, laboratories, libraries, shops, music rooms, gymnasiums, art, commercial, home economics rooms, etc.

The following general suggestions are made. Modifications should be made to suit local conditions. Detailed suggestions are made in items 305 - 338.

INSTRUCTIONAL AREAS (Cont'd)

a. Areas

1. Unless otherwise noted the areas shown for classrooms, commercial rooms, agricultural rooms, general art rooms, library, gymnasium, general science rooms, will accommodate 40 pupils.

2. General Shop, General Homemaking, Clothing and Food Laboratories, Vocational Science and Art Rooms, Vocational Shops, will accommodate 20 pupils.

3. Unless otherwise shown, an allowance is included in each area to provide for the necessary storage of supplies and equipment.

4. Shop areas provide sufficient space for the initial shop in a particular activity. Additional shops for the same activity may be reduced in size.

b. Widths

In general the following minimum widths are suggested.

1. Classrooms, Commercial rooms, Agricultural rooms, General & Vocational Art rooms, Library, General & Vocational Science, General Homemaking, Food & Clothing Laboratories, Drafting — 23 feet

2. All shops and other spaces unless otherwise noted — 30 feet

c. Ceiling Heights

The following ceiling heights are suggested.

1. Classrooms, Commercial rooms, Agricultural rooms, General & Vocational Art rooms, Library, General Homemaking, Food & Clothing Laboratories, Drafting — 9 to 12 feet

Note: Particular care should be taken in designing artificial lighting where ceilings are lower than 10'-6".

2. All shops and other spaces unless otherwise noted — 12 feet

3. Window heads should be kept as high as possible.

d. Layouts

1. The board, principal, and supply houses should collaborate and furnish the architect with room and shop layouts so that the necessary utilities can be properly located and built in for the installation of equipment.

2. This information should be available to the architect well in advance of construction, otherwise the architect will be obliged to use his discretion with respect to locating utilities and fixed equipment.

3. If information is not available for power outlets for machines, the architect may bring the amount of power required into the shop concerned and leave it dead-ended with a suitable panel or switch. The final distribution and connections would then be completed by the Board or by the machinery supply houses concerned.

303. AUXILIARY AREAS

Auxiliary areas are those which do not carry an instructional load but are necessary to make the school function as a whole. They provide for the following.

a. Administrative Offices, Teachers' Rooms, Offices for Department Heads, Student Supply Rooms.

b. Health Service, Vocational Guidance or Counselling Offices.

c. Auditoriums (with fixed seats), stage, dressing and property rooms.

d. P.T. Instructor's Office, Apparatus Room, Locker and Shower rooms, Spectator Galleries.

e. Cafeteria, Lunch Rooms, Kitchens.

f. Cadet Quarters, Shooting Gallery.

g. General Store Rooms, Boiler Room, Maintenance and Caretaker Quarters.

h. Washrooms and Toilets for staff and pupils.

i. Corridor, stairwells, entrances and other structural requirements.

The size, variety and appointment of such spaces depend upon the size of the school and the services which the school proposes to offer.

It should be noted that gymnasiums are not classed as auxiliary areas, since they carry an instructional load for physical training.

304. FURNITURE & EQUIPMENT

a. The cost of furniture and equipment varies considerably, especially for Vocational subjects. It is essential that Boards make careful investigations with supply houses and compile equipment lists for approval by the Department before commitments are made.

b. Estimated amounts for furniture and equipment are indicated as follows.

Instructional Areas, Items 305 - 338.
Auxiliary Areas, Items 339 - 354.

The amounts shown do not include such fixed equipment as may be included in the building contract, Item 10.

c. In the case of Vocational Shops the amounts shown are sufficient for the equipment of the first shop of the kind in question. Additional shops of the same kind are not likely to require as large an expenditure.

305. CLASSROOMS

Intended for English, Mathematics, Social Studies, Geography, History, Health, etc.

CLASSROOMS (Cont'd)

Location: Removed from noisy activities
Floor Area: 690 to 740 sq. ft. Min. 17 sq. ft. per pupil
Floor Surface: Linoleum, Asphalt Tile, Hardwood
Convenience Outlets: Two, one at each end of the room
Light Intensity on desks: 20 to 30 foot-candles
Chalkboard: 60 sq. ft. Tackboard: 60 sq. ft.
Estimate Furniture & Equipment: $800.00 to $1200.00

a. Considerable variations may be required. There may be reasons for an oversize or an undersize room. Each room should be planned for its specific purpose. Chalkboard and tackboard requirements vary. Rooms for mathematics require as much blackboard space as possible while rooms for social studies favour tackboard.

b. Built-in cupboards along the classroom side of the corridor wall are desirable for the storage of classroom supplies and equipment. If necessary the doors to such cupboards may be faced with tackboards.

c. Arrangements may be made to darken one or two strategically located classrooms for the use of a projector. This applies particularly to social study rooms.

306. LIBRARY

Location: Quiet, central, adjacent to English and Social Studies rooms.
Floor Area: 900 to 1200 sq. ft. Min. 23 sq. ft. per pupil
Floor Surface: Linoleum, Asphalt Tile
Convenience Outlets: 4
Light Intensity on Tables: 20 to 30 foot-candles
Chalkboard: 30 sq. ft. Tackboard: 15 sq. ft.
Acoustic Treatment: Sound absorptive ceiling desirable
Estimate Furniture, Equipment and initial books $2,000.00 to $4,000.00

a. In many schools the library is used as a classroom. It is also used as a Board room and for teachers' meetings.

b. Adjustable bookshelves, map files, magazine racks, etc., should be built into all available wall space.

c. The furniture should consist of movable library tables and chairs together with the necessary filing and record cabinets.

d. Special texts and reference material peculiar to vocational activities should be kept in the room or shop concerned rather than in the central library.

e. The normal facilities of the school library may be made available to the public. It is not necessary, however, that the school library be enlarged or equipped to function as a public library.

307. ART ROOM (General)

Location: North Exposure, adjacent to shops, and/or Home Economics
Floor Area: 1000 to 1200 sq. ft. Min. 25 sq. ft. per pupil
Floor Surface: Linoleum, Asphalt Tile, Hardwood
Washing: Work Sink
Gas: Desirable
Convenience Outlets: 4
Light Intensity: 40 to 50 foot-candles
Chalkboard: 60 sq. ft. Tackboard: one wall, floor to ceiling
Furniture and Equipment: $2,000.00 to $3,000.00

a. Art has a wide application and includes many crafts. The general art room should be equipped and arranged to give experience in as many crafts as possible. This may include drawing, painting, modelling, bookbinding, weaving, block printing, carving, model making, ceramics, and work in wood, metal, leather, and plastics, etc.

b. A considerable amount of storage space is necessary. A storeroom may be provided. Built-in cupboards, which may be faced with tackboard material or standard cupboards, racks, bins, etc., may be purchased and placed in the room.

c. If air brush painting is required a small portable machine is recommended. Compressed air from a central compressor is not satisfactory.

d. Suitable means should be provided to darken the room for the use of a projector or delineascope.

e. Schools with one art room will be obliged to provide all art and craft activities in the one room. When two art rooms are required for general art and craft work the rooms may be equipped in whatever manner is convenient. In this case, the storeroom mentioned should be common to both rooms.

308. ART ROOM (Vocational).

Location: North exposure, adjacent to shops and/or Home Economics
Floor Area: 800 to 1,000 sq. ft. Min. 40 sq. ft. per pupil
Floor Surface: Linoleum, Asphalt Tile, Hardwood
Washing: Work sink
Gas: Desirable
Convenience Outlets: 4
Light Intensity: 40 to 50 foot-candles
Chalkboard: 60 sq. ft. Tackboard: one wall, floor to ceiling.
Furniture and Equipment: $2,000.00 to $3,000.00

a. Vocational schools may offer art as a special vocational subject. In this case, the class load is 20. Rooms may be set aside for special subjects such as design, life-drawing, modelling, ceramics, etc. The arrangement of each room and the equipment selected require detailed consideration.

b. Apart from special rooms, there may be the need for a general art room where a full class load would be carried. In this case, a room of the kind and size mentioned in Item 307 would be required.

ART ROOM (Vocational) (Cont'd)

c. The matter of storage, darkening and compressed air may be provided as indicated in Item 307 b, c and d.

309. MUSIC ROOM

Location: Remote as possible from classrooms and administration quarters. Near stage, if possible.
Floor Area: 1000 to 1200 sq. ft. Min. 25 sq. ft. per pupil
Floor Surface: Linoleum
Convenience Outlets: 4
Light Intensity: 20 to 30 foot-candles
Chalkboard: 30 sq. ft. Tackboard: 60 sq. ft.
Acoustic Treatment: essential walls and ceiling
Estimate Furniture and Equipment $1500.00 to $5000.00

a. In small schools a regular classroom may be used upon occasion as a music room. When schools are large enough to keep a full class in the music room most of the time, it is desirable to establish a room as described. Medium size schools might consider a room for the combined purpose of music and visual education in which case the size as described would be satisfactory.

b. Suitable storage cupboards for music stands, band and orchestral instruments and accessories are required.

c. A good ground and aerial should be provided for a Radio Receiver.

d. If the school has a public address system provision should be made so that programmes can be tied into such a system.

e. Provision should be made for a record player and suitable record storage provided.

f. Stepped floors, a conductor's rostrum, and a small platform may be considered but these features are inclined to restrict the flexibility of the room.

g. In very large schools, the establishment of a few individual practice booths may be considered.

310. VISUAL EDUCATION ROOM

Location: Adjacent to Music Room
Floor Area: 690 to 720 sq. ft. Min. 17 sq. ft. per pupil
Floor Surface: Linoleum, Asphalt Tile, Hardwood
Convenience Outlets: 4
Light Intensity: 20 to 30 foot-candles
Chalkboard: 15 sq. ft. Tackboard: 30 sq. ft.
Acoustic Treatment: Desirable
Estimate Furniture and Equipment: $1500.00 to $3000.00

a. Visual Education has always been an integral part of the educative process. Modern developments in the way of projectors, delineascopes, and film libraries have progressed to the point where provision for their use cannot be ignored.

VISUAL EDUCATION ROOM (Cont'd)

b. Large groups can be accommodated in the auditorium or cafeteria.

In large schools where such a room will carry a full class load most of the time, a special room as described may be established.

Medium size schools may find it expedient to combine this subject with music, in which case the size of the room should be governed by the music room, Item 309.

Small schools find that a standard classroom may be used upon occasion for visual education.

c. Apart from specially designated rooms for visual education arrangements for darkening a few strategic rooms is advisable so that illustrative materials may be introduced at the proper time and place for the subject concerned. One such room in each of the following departments might be considered: Art, Science, Home Economics, Social Studies, etc. Some schools prefer a number of darkened classrooms rather than a specially designated room.

d. If a Visual Education room is set up as such, it should be equipped for film and sound, slide film projector and delineascope.

Suitable cupboards should be provided for the equipment. It is important to provide steel cabinets for film storage.

311. HOME ECONOMICS

Accommodation, equipment and furniture should be provided for the full range of girls' practical work, viz., Home Care, Food Preparation and Service, Laundry, Sewing, Child Development and Family Living. Such provision varies depending upon the size and kind of secondary school concerned. The following suggestions may serve as a general guide.

a. In schools where a full class load will be in attendance most of the time, a General Homemaking Room, Item 312, is required.

b. In large schools 2 or more General Homemaking Rooms, Item 312, may be required.

c. In Vocational schools one or more General Homemaking rooms, Item 312, are usually required. In addition, specialized rooms such as Clothing Laboratories, Item 313, and Food Laboratories, Item 314, are usually necessary.

In some Vocational schools, provision for the inclusion of power operating, laundry work, etc., may grow to the point where separate rooms for these subjects are necessary.

d. In very small schools where the class load is small or where the room may be used for a limited time, an area of 500 to 700 sq. ft. is suggested. The room may be set up in a similar fashion to General Homemaking, Item 312, with a limited amount of equipment costing from $2,000.00 to $3,000.00

312. GENERAL HOMEMAKING ROOM

Location: Adjacent to Art room, convenient to service entrance.
Floor Area: 1,000 to 1,400 sq. ft. Min. 50 sq. ft. per pupil
Floor Surface: Linoleum, Asphalt Tile
Washing: Hand Basin
Gas: May be desirable for one stove
Convenience Outlets: 10, (4 with pilot lights for irons and heating devices.)
Power: for 2 stoves, ironing machine
Light Intensity: 20 to 30 foot-candles
40 to 50 foot-candles desirable in sewing area
Ventilation: Independent Exhaust
Chalkboard: 30 sq. ft. Tackboard: 30 sq. ft.
Furniture & Equipment: $4,000.00 to $6,000.00

a. General Considerations

1. The room should be appointed, furnished, and decorated to suggest the atmosphere found in the modern home.

2. The room may be divided to suggest designated activities. This may be done with furniture or with low functional partitions generally not more than four feet high. Such partitions could be 12" to 24" wide and form a series of cupboards, racks, shelves, bins, etc., accessible from one or both sides for storage purposes. They should be sufficiently stable to stand under their own weight and should be in convenient sections to permit rearrangement without the use of tools.

3. It is essential that the position of sinks, tubs, drainboards, sink decks, stoves, refrigerators, etc., be considered carefully and that they be built into the building permanently.

4. Adequate storage facilities are essential. Storage may be provided by cupboards built into the wall and equipped with shelves to accommodate tote-boxes. The doors to such cupboards should be full length. Wardrobes may be built into the wall in a similar fashion to provide storage for outdoor clothes for evening school pupils or for pupils who may be sent from adjacent day schools. Such wardrobes should be properly ventilated.

5. Care should be taken that in an attempt to get storage space, wall space is not lost to the extent that the room loses its flexibility. Apart from essential built-in equipment, all other furnishings and equipment should be of a standard self-contained character which can be easily rearranged from time to time.

6. Wall space is at a premium. It is seldom desirable to provide windows on more than one wall. Attention should be given to the kind, size, and arrangement of windows for draping purposes. All windows should be screened.

7. The door or doors to the room should not be located at the extreme end of the room. A minimum distance of 8 feet from the end of the room to the nearest door jamb is suggested.

GENERAL HOMEMAKING ROOM (Cont'd)

a. General Considerations (Cont'd)

8. It is desirable that the amount of equipment installed is such that the pupils will find adequate opportunity for experience in all activities. All equipment, however, should be in use most of the time. It is not desirable to install an excess of equipment for one activity to the point where other equipment may stand idle.

9. A switch to disconnect all electric stoves and convenience outlets, with provision for locking, should be installed at some convenient point.

10. An illuminated locked display case facing on the corridor and accessible from the room is desirable.

b. Living Room Area

This area should be immediately inside the entrance. It may be furnished with chesterfield, occasional chairs, coffee or end tables, bookcase, rug, floor lamp, pictures and suitable ornaments and accessories. The teacher's desk, filing and supply cabinets might be included in this area.

c. Dining Room Area

The dining room should be adjacent to the kitchen and, if possible, the living room area. It may be furnished with tables, chairs, buffet, teawagon, etc. If space does not permit a formal dining room, it may be set up informally in the living room or kitchen area.

d. Kitchen Area

The kitchen area should include two or more self-contained kitchen units designed on the home kitchen pattern. They should be located where there is sufficient wall space for cupboards. Each kitchen unit should be equipped with a double sink set in sink decks 36" high with cupboards above and below, a work table, and a stove. Work area should be adequate for 4 students. Above and below the sink decks functional drawers and well-ventilated cupboards should be built. One centrally located refrigerator will serve more than one kitchen.

e. Laundry Area

1. The laundry may be located adjacent to the kitchen for convenience of installation. The following equipment may be required: one set double compartment enamel tubs, wringer, tables, supply cupboard, drying cabinet, rack, washing machine, ironing board and accessories.

2. If the ironing board is fixed, it should be placed in a good light and affixed to rather than built into the wall and arranged so that it can be moved to some other location. If portable boards are used, a cupboard for storage is necessary. A suitable cupboard for the storage of brooms and other cleaning utensils is necessary.

GENERAL HOMEMAKING ROOM (Cont'd)

f. Sewing Area

1. Leave as much space as possible. This area may serve a variety of purposes and should be flexible. It should be given a preferred location in terms of light. The following equipment may be required: 2 or 3 electric sewing machines, one treadle machine; 3 or 4 tables 3' by 5' by 28" high, with lino tops; library type chairs with storage accommodation for boxes below; suitable storage accommodation including wardrobes for hanging work in progress; cupboards for teacher's and classroom supplies and pupils' supplies and sewing; ironing board, and accessories.

2. Fitting facilities which provide good light and offer a reasonable degree of privacy are essential. A separate fitting room generally requires too much space. It is suggested that a 3-fold mirror be mounted on the wall and the sides used to service as a screen. As an alternative, the doors on wardrobes may be arranged for this purpose.

3. A light-coloured chalkboard extending to the floor may be desirable for dress design.

g. Bedroom Area (Optional)

If space permits, a bedroom area may be planned to accommodate a single bed, dressing table, and accessories. Otherwise a roll-away bed which will give satisfactory experience in proper bedmaking may be used, in which case a storage cupboard would be desirable.

313. CLOTHING LABORATORY

Location: Adjacent to General Homemaking room
Floor Area: 700 to 900 sq. ft. Min. 35 sq. ft. per pupil
Floor Surface: Linoleum, Asphalt Tile
Washing: Hand Basin
Convenience Outlets: 10, (4 with pilot lights for irons)
Light Intensity: 40 to 50 foot-candles
Chalkboard: 30 sq. ft. Tackboard: 30 sq. ft.
Furniture and Equipment: $2,000.00 to $3,000.00

a. The furniture and equipment is of the same class and kind as that for the sewing unit, Item 312, f. About 8 domestic type electric sewing machines and 2 treadle type together with a suitable number of tables, chairs, and storage equipment and other accessories for a full class are required.

b. A small fitting room rather than the 3-fold mirror may be desirable.

c. If some Commercial Power Sewing Machines are required, it will be necessary to run a separate circuit to each such machine. An additional allowance of $200.00 should be made for each commercial machine.

d. As much wall space as possible should be furnished with cupboards arranged for tote-boxes and for hanging garments and storing supplies.

314. FOOD LABORATORY

Location: Adjacent to and communicating with General Homemaking room.
Floor Area: 700 to 900 sq. ft. Min. 35 sq. ft. per pupil
Floor Surface: Linoleum, Asphalt Tile
Washing: Hand Basin
Gas: May be desirable for some stoves
Convenience Outlets: 6
Power: for stoves and other heating devices
Light Intensity: 20 to 30 foot-candles
Ventilation: Independent Exhaust
Furniture & Equipment: $3,000.00 to $4,000.00

a. This room is intended principally for meal preparation and serving. One Formal Dining Room as outlined in Item 312, c, should be included. In addition to the Formal Dining room there should be provision for informal food service for each kitchen. It is usually necessary to include a laundry unit, Item 312, e.

b. General considerations, Item 312, a, should be observed. The available area should be devoted to as many kitchen units as possible as shown in Item 312, d.

315. GENERAL SCIENCE LABORATORY

Location: Adjacent to Agriculture and/or General Shop and/or Mathematics
Floor Area: 900 to 1100 sq. ft. Min. 23 sq. ft. per pupil
Floor Surface: Asphalt Tile, Linoleum, Hardwood
Convenience Outlets: as noted
Light Intensity: 20 to 30 foot-candles
Ventilation: Independent Exhaust
Chalkboard: 90 sq. ft. Tackboard: 60 sq. ft.
Furniture & Equipment: $3500.00 to $6000.00

a. In small schools which require only one Science Laboratory, it becomes necessary to arrange and equip the Laboratory for both Chemistry and Physics. Large schools may require General Science Laboratories and in addition may establish additional Chemistry, Physics, and other special laboratories as indicated in Item 316 to Item 319. Biology is taken in one of the other laboratories.

b. The furnishings and utilities in the General Science Laboratory should be selected and installed primarily from a Chemistry point of view.

c. The furniture may be arranged in various ways. Two possible arrangements are suggested as follows:

1. A teacher's demonstration bench at the front end of the room. Fixed pupil benches (seats attached) for 2 or 3 pupils arranged to face to the front of the room.

2. A teacher's demonstration bench at the front end of the room. Movable pupil tables and stools. Fixed pupil bench to provide working facilities where sinks are required to accommodate 25% of the class.

d. A supply of cold water is essential for the teacher's bench, student benches, aquarium, and preparation room. A supply of hot water may be considered.

e. Drains and soil lines should be of acid resisting material. Cleanouts should be provided. Accessibility for maintenance and repair should be considered.

f. Each bench should be provided with a gas supply. A master control valve which can be locked should be provided.

g. Each bench should be provided with one or two convenience outlets.

h. Adequate provision to carry away fumes both heavier and lighter than air is essential. The exhaust end of the duct should be carried to a point where there will be no danger of fumes re-entering the building. Such an arrangement should be simple, positive and so arranged that fixed ducts, hoods, etc., will not obstruct the pupils' vision of the teacher's demonstration bench. Two methods are suggested.

1. Ducts built into each bench with removable hoods. A screen should be placed in the duct to trap objects which may fall in the duct when hoods are removed.

2. One or more fume cabinets; one to be installed convenient to the teacher's demonstration bench.

i. Each bench including the teacher's should be provided with a small acid-resisting sink. As an economy measure sinks installed in alternate rows may be considered where fixed bench accommodation is provided for an entire class.

j. Wherever possible standard laboratory furniture should be purchased. Such furniture has been developed to the point where all of the requirements mentioned in d, e, f, g, h, and i are incorporated. In addition standards, rods, clamps, drawers, shelves, etc., are offered as optional equipment.

All of the tops and working surfaces should be substantial and treated to resist acid.

It is essential that the furniture and built-in equipment be selected sufficiently ahead of construction so that all necessary connections can be properly located and installed in the structure.

k. If an Agriculture room is included in the school, common use may be made of the greenhouse or growing bench. If such a room is not included, a small greenhouse or growing bench as described in Items 323, d, and e, should be provided. In this case, a sunny exposure is desirable.

l. An aquarium similar to that described in Item 323, c, is desirable.

m. Consideration should be given to the way in which class supplies and equipment are to be handled. Several methods are in use, two of which are suggested as follows.

1. A sufficient number of drawers with suitable locking arrangements to provide for the number of class shifts at each pupil bench.

m. 2. Drawer slides at each pupil bench to accommodate standard-size drawers which are kept in class storage cupboards; the cupboard for each class under a separate lock.

n. Provision should be made to darken the laboratory for the use of a projector.

o. A small storage and preparation room (about 100 sq. ft.) with direct communication from the laboratory should be provided. If the school has more than one laboratory then a storage and preparation room should be provided between each pair of laboratories in which case the area should be increased to 150 sq. ft.

This room should be provided with sink, convenience outlets fume removal facilities, bench and suitable shelves.

316. CHEMISTRY LABORATORY

Location: Adjacent to General Science and/or Physics Laboratory.
Floor Area: 900 to 1100 sq. ft. Min. 23 sq. ft. per pupil
Floor Surface: Asphalt Tile, Linoleum, Hardwood
Convenience Outlets: 4 (2 at teacher's bench)
Light Intensity: 20 to 30 foot-candles
Ventilation: Independent Exhaust
Chalkboard: 90 sq. ft. Tackboard: 60 sq. ft.
Furniture & Equipment: $3500.00 to $6000.00

a. The furniture may be arranged in various ways. Two possible arrangements are suggested as follows:

1. A teacher's demonstration bench at the front end of the room; fixed pupil benches (seats attached) for 2 or 3 pupils arranged to face to the front of the room.

2. A teacher's demonstration bench at the front end of the room; movable pupil tables and stools; fixed pupil bench to provide working facilities where sinks are required to accommodate 25% of the class.

b. A supply of cold water is essential for teacher and pupil benches and for the preparation room. A supply of hot water may be considered.

c. Drains and soil lines should be of acid-resisting material. Cleanouts should be provided. Accessibility for maintenance and repair should be considered.

d. Each bench should be provided with a gas supply. A master control valve which can be locked should be provided.

e. Adequate provision to carry away fumes both heavier and lighter than air is essential. The exhaust end of the duct should be carried to a point where there will be no danger of fumes re-entering the building. Such an arrangement should be simple, positive and so arranged that fixed ducts, hoods, etc., will not obstruct the pupils' vision of the teacher's demonstration bench. Two methods are suggested.

1. Ducts built into each bench with removable hoods. A screen should be placed in the duct to trap objects which may fall in the duct when hoods are removed.

CHEMISTRY LABORATORY (cont'd)

e. 2. One or more fume cabinets; one to be installed convenient to the teacher's demonstration bench.

f. Each bench including the teacher's should be provided with a small acid-resisting sink. As an economy measure sinks installed in alternate rows may be considered where fixed bench accommodation is provided for an entire class.

g. Wherever possible standard laboratory furniture should be purchased. Such furniture has been developed to the point where all of the requirements mentioned in b, c, d, e, and f are incorporated. In addition standards, rods, clamps, drawers, shelves, etc., are offered as optional equipment.

All of the tops and working surfaces should be substantial and treated to resist acid.

It is essential that the furniture and built-in equipment be selected sufficiently ahead of construction so that all necessary connections can be properly located and installed in the structure.

h. Consideration should be given to the way in which class supplies and equipment are to be handled. Several methods are in use, two of which are suggested as follows:

1. A sufficient number of drawers with suitable locking arrangements to provide for the number of class shifts at each pupil bench.

2. Drawer slides at each pupil bench to accommodate standard-size drawers which are kept in class storage cupboards; the cupboards for each class under a separate lock.

i. Provision should be made to darken the laboratory for the use of a projector. This may not be necessary if such provision is made in an adjacent laboratory.

j. A small storage and preparation room (about 100 sq. ft.) with direct communication from the laboratory should be provided. If the school has more than one laboratory, a storage and preparation room should be provided between each pair of laboratories; in this case the area should be increased to 150 sq. ft.

This room should be provided with sink, convenience outlets, fume removal facilities, bench and suitable shelves.

317. CHEMISTRY LABORATORY (Vocational)

Location: Adjacent to Chemistry or Physics Laboratory
Floor Area: 700 to 800 sq. ft. Min. 35 sq. ft. per pupil
Floor Surface: Asphalt Tile, Linoleum, Hardwood
Convenience Outlets: As noted
Light Intensity: 20 to 30 foot-candles
Ventilation: Independent Exhaust
Chalkboard: 60 sq. ft. Tackboard: 60 sq. ft.
Furniture & Equipment: $3500.00 to $6000.00

a. This laboratory is intended for smaller classes than the laboratory in Item 316. It should be furnished and appointed in a similar fashion as outlined in Item 316.

CHEMISTRY LABORATORY (Vocational)

b. Vocational schools may offer courses where pupils specialize in industrial chemistry. The cost of the furniture will be less than that required for a full size laboratory. The equipment and apparatus, however, is likely to cost more.

c. The class and kind of equipment will depend upon the specialized training offered. This may vary from one locality to another.

d. In some Vocational schools, this laboratory may be combined with a Physics Laboratory, Item 319.

318. PHYSICS LABORATORY

Location: Adjacent to General Science and/or Chemistry Laboratory
Floor Area: 900 to 1100 sq. ft. Min. 23 sq. ft. per pupil
Floor Surface: Asphalt Tile, Linoleum, Hardwood
Convenience Outlets: As noted
Light Intensity: 20 to 30 foot-candles
Ventilation: General
Chalkboard: 90 sq. ft. Tackboard: 60 sq. ft.
Furniture & Equipment: $3500.00 to $6,000.00

a. The furniture may be arranged in various ways. Two possible arrangements are suggested as follows:

1. A teacher's demonstration bench at the front end of the room; fixed pupil benches (seats attached) for 2 or 3 pupils arranged to face to the front of the room.

2. A teachers' demonstration bench at the front end of the room; movable pupil tables and stools; fixed pupil bench to provide working facilities where sinks are required to accommodate 25% of the class.

b. A supply of cold water is essential for teacher and pupil benches and for the preparation room. A supply of hot water may be considered.

c. Each bench should be provided with a gas supply. A master control valve which can be locked should be provided.

d. Each bench including the teacher's should be provided with a small sink. As an economy measure sinks installed in alternate rows may be considered where fixed bench accommodation is provided for an entire class.

e. Sinks, drains, bench tops, etc. are not required to be acid resisting if the laboratory is to be used exclusively for physics.

f. Each bench including the teacher's should be equipped with 110 volt convenience outlets.

g. Wherever possible standard laboratory furniture should be purchased. Such furniture has been developed to the point where all of the requirements mentioned in b, c, d, e, and f are incorporated. In addition standards, rods, clamps, drawers, shelves, etc., are offered as optional equipment.

PHYSICS LABORATORY (Cont'd)

g. It is essential that the furniture and built-in equipment be selected sufficiently ahead of construction so that all necessary connections can be properly located and installed in the structure.

h. Consideration should be given to the way in which class supplies and equipment are to be handled. Several methods are in use, two of which are suggested as follows:

1. A sufficient number of drawers with suitable locking arrangements to provide for the number of class shifts at each pupil bench.

2. Drawer slides at each pupil bench to accommodate standard size drawers which are kept in class storage cupboards; the cupboards for each class under a separate lock.

i. Provision should be made to darken the laboratory for the use of a projector. This may not be necessary if such provision is made in an adjacent laboratory.

j. A small storage and preparation room (about 100 sq. ft.) with direct communication from the laboratory should be provided. If the school has more than one laboratory, a storage and preparation room should be provided between each pair of laboratories; in this case the area should be increased to 150 sq. ft.

This room should be provided with sink, convenience outlets, bench, and suitable shelves.

319. PHYSICS LABORATORY (Vocational)

Location: Adjacent to Chemistry or Physics Laboratory
Floor Area: 700 to 800 sq. ft. Min. 35 sq. ft. per pupil
Floor Surface: Linoleum, Asphalt Tile, Hardwood
Convenience Outlets: As noted
Light Intensity: 20 to 30 foot-candles
Ventilation: General
Chalkboard: 60 sq. ft. Tackboard: 60 sq. ft.
Furniture & Equipment: $3500.00 to $6000.00

a. This laboratory is intended for smaller classes than the laboratory in Item 318. It should be furnished and appointed in a similar fashion as outlined in Item 318.

b. Vocational schools may offer courses where pupils specialize in industrial physics. The cost of the furniture will be less than that required for a full size laboratory. The equipment and apparatus, however, is likely to cost more.

c. The class and kind of equipment will depend upon the specialized training offered. This may vary from one locality to another.

d. In some vocational schools this laboratory may be combined with a chemistry laboratory, Item 317.

320. TYPING ROOM (Vocational)

Floor Area: 900 to 1100 sq. ft. Min. 23 sq. ft. per pupil
Floor Surface: Linoleum, Asphalt Tile, Hardwood
Convenience Outlets: 4
Light Intensity: 40 to 50 foot-candles
Chalkboard: 60 sq. ft. Tackboard: 120 sq. ft.
Furniture & Equipment: $5,000.00 to $7,000.00

a. Typing rooms should be oriented so that light comes over the right shoulder of the pupil. Combination desks may be used which enable pupils to face in the opposite direction for work other than typing. In this case chalkboards should be installed at both ends of the room.

b. This room is inclined to be noisy. It is desirable that the ceiling and possibly the walls be treated with acoustic material.

c. In small schools there may be only one commercial room. The typing room as outlined may be laid out and equipped to provide for the full range of commercial work. This may be done by allocating space as required. Sub-dividing the room by the use of partitions is not recommended.

321. BUSINESS MACHINES ROOM (Vocational)

Location: Adjacent to Typing room
Floor Area: 900 to 1100 sq. ft. Min. 23 sq. ft. per pupil
Floor Surface: Linoleum, Asphalt Tile, Hardwood
Convenience Outlets: 6
Light Intensity: 40 to 50 foot-candles
Chalkboard: 30 sq. ft. Tackboard: 60 sq. ft.
Furniture & Equipment: $10,000.00 to $15,000.00

a. This room is inclined to be noisy. It is desirable that the ceiling and possibly the walls be treated with acoustic material.

b. It is desirable that built-in cupboards be installed in the room. Such cupboards should be designed to accommodate the attachments, accessories and supplies associated with the work.

322. COMMERCIAL OFFICE PRACTICE (Vocational)

Location: Adjacent to Typing room
Floor Area: 500 to 600 sq. ft. Min. 25 sq. ft. per pupil
Floor Surface: Linoleum, Asphalt Tile
Convenience Outlets: 4
Light Intensity: 40 to 50 foot-candles
Tackboard: 60 sq. ft.
Furniture & Equipment: $2,000.00 to $3,000.00

a. This room is intended to give senior students some practice in the organization, routine and procedures followed in a typical business office.

b. There should be a small waiting room divided off by a counter immediately inside the entrance. An additional door may be provided to communicate with the adjacent typing room.

COMMERCIAL OFFICE PRACTICE (Vocational) (Cont'd)

c. Sub-divisions of this room may be suggested by the general arrangement of the furniture. Partitions are not recommended. It is suggested that all furniture and equipment be movable and that it be re-arranged periodically to give experience in various working conditions.

d. This room will accommodate 20 pupils. Some medium-size schools may find that only 10 to 12 students require office practice accommodation. In this case the size of the room and the cost of equipment may be reduced. As an alternative, commercial office practice could be included in the Business Machines Room.

323. AGRICULTURE ROOM

Location: South exposure, adjacent to General Shop and/or Science Room.
Floor Area: 1000 to 1200 sq. ft. Min. 25 sq. ft. per pupil
Floor Surface: Asphalt Tile, Hardwood
Gas: Desirable
Convenience Outlets: 4
Light Intensity: 20 to 30 foot-candles
Chalkboard: 60 sq. ft. Tackboard: 15 sq. ft.
Furniture & Equipment: $1,500.00 to $2,000.00

a. This room should be equipped with pupil benches or tables and a teacher's demonstration bench. The tops of these benches should be acid resisting. The teacher's bench should be provided with a sink, hot and cold water, one or two electric outlets, and gas if available.

b. A storeroom (150 sq. ft.) should be taken off one end of the room and direct access arranged from the main room. A single door with grade entrance off the storeroom is required for ready access to an outside garden plot.

c. A water supply and drain should be provided for the installation of an aquarium (6 to 8 cubic feet).

d. A small greenhouse (approximately 100 to 150 sq. ft.) is desirable with direct access from the classroom. The greenhouse should be provided with a water supply and a floor drain.

e. If a greenhouse is not feasible, a growing bench should be installed along the window wall of the main room. The bench should be made of non-corrosive material and convenient means of drainage provided.

324. GENERAL SHOP

Location: Grade Level, adjacent to Agriculture room
Floor Area: 1400 to 1800 sq. ft. Min. 70 sq. ft. per pupil
Floor Surface: As noted
Washing: Wash Tray for 6 students
Gas: Desirable
Convenience Outlets: 6
Power: 3 H.P.
Light Intensity: 20 to 30 foot-candles
Ventilation: Independent Exhaust
Chalkboard: 15 sq. ft. (Portable) Tackboard: 15 sq. ft.
Furniture & Equipment: $4,000.00 to $6,000.00

GENERAL SHOP (Cont'd)

a. Schools which include one or more General Shops are not regarded as Vocational Schools. Refer to Vocational Shops, Item 325.

b. A General Shop should provide space and equipment for four practical subjects.

c. The shop as described is intended for schools where a full class load will be in attendance most of the time.

d. In large schools 2 or more general shops may be required. In this case the four options may be parallel in each shop but consideration should be given to the introduction of a wider range of practical activities. It is also possible to offer a limited number of activities in each shop provided at least 4 practical activities are offered.

e. In very small schools where the class load is small or where the shop may be used for a limited time, an area of 700 to 900 sq. ft. is suggested. The shop may be set up in a similar fashion to the one described with a limited amount of equipment costing from $2,000.00 to $3,000.00.

f. The Board should decide at an early date as to the options to be offered.

g. Should Motor Mechanics or Farm Mechanics be included, the entire floor should be concrete. If these subjects are not included, the floor may be hardwood.

h. Forge work may be required in rural centres; it is not likely to be as popular in urban centres. If forge work is included, a concrete slab about 8' X 10' and a 9" flue should be provided.

i. A grade entrance with an overhead door 10 feet wide is essential if Motor or Farm Mechanics are to be subjects of instruction. If more than one Shop is required, the grade entrance is necessary for only one Shop. Communication with adjacent Shops should be provided for the delivery of materials.

j. The General Shop should not be sub-divided into small areas. Self-contained cupboards, racks, bins, etc., are suitable for the storage of tools and supplies, which should be kept adjacent to the activity concerned. It is not desirable to enclose areas for drafting or painting.

325. VOCATIONAL SHOPS

a. The shop department in a Vocational school or in a school with a Vocational department should include at least four different Vocational Shops, and a Shop Director should be appointed.

b. Suggested requirements for some Vocational shops are shown in Item 326 to Item 337. Local requirements may indicate the need of other types of shops in which case the Board should make representations to the Department for the establishment of such shops.

VOCATIONAL SHOPS (Cont'd)

c. It is unnecessary to provide each shop with a classroom. One classroom might be set aside for the use of the Shop Department.

d. Tool cribs in shops are not desirable. It is better to provide cupboards, racks, etc., and keep tools associated with the work at convenient points. Materials and supplies can be handled in a similar manner.

326. DRAFTING ROOM (Vocational)

Location: North Light, adjacent to shops
Floor Area: 800 to 1000 sq. ft. Min. 40 sq. ft. per pupil
Floor Surface: Linoleum, Asphalt Tile, Hardwood
Convenience Outlets: Two, one each end of room
Power: Allow for blue print machine
Light Intensity on desks: 40 to 50 foot-candles
Chalkboard: 30 sq. ft. Tackboard: 60 sq. ft.
Estimate Furniture & Equipment: $1500.00 to $2000.00

a. If only one drafting room is required, the floor area shown will permit the installation of a blueprint or ozalid machine in the room itself. If more than one drafting room is required, a small blueprint room approximately 200 sq. ft. should be provided for common use. If a separate blueprint room is made available, then the maximum size of the drafting rooms can be limited to 800 sq. ft. each.

b. The amount shown for furniture and equipment includes a blueprint or ozalid machine at an estimated cost of $500.00. The cost of equipping additional rooms may be reduced accordingly.

c. It is important that power and, if necessary, water and drains be installed to suit the equipment selected.

327. MACHINE SHOP (Vocational)

Location: Adjacent to other Metal Working Shops
Floor Area: 1400 to 1600 sq. ft. Min. 70 sq. ft. per pupil
Floor Surface: Wood Block, Laminated Edge Grain plank or equivalent
Washing: Wash Tray for 6 pupils
Convenience Outlets: 6
Power: 20 H.P.
Ventilation: Independent Exhaust
Gas: Desirable
Compressed Air: Desirable
Light Intensity: 20 to 30 foot-candles
Chalkboard: 15 sq. ft. Tackboard: 15 sq. ft.
Furniture & Equipment: $30,000.00 to $40,000.00

a. The machine shop requires expensive equipment to offer a course satisfactory to industry. The amount shown will allow for some modern grinding and heat treating equipment.

b. A 6" to 9" flue is required to take care of fumes from heat treating.

c. Double doors to the corridor are required to admit machinery and equipment.

328. MOTOR MECHANICS SHOP (Vocational)

Location: Grade Level
Floor Area: 1600 to 2600 sq. ft. Min. 80 sq. ft. per pupil
Floor Surface: Concrete (Hardened)
Washing: Wash Tray for 6 pupils
Convenience Outlets: 10
Power: 5 H.P.
Ventilation: as noted
Gas: Desirable
Compressed Air: Required
Light Intensity: 20 to 30 foot-candles
Chalkboard: 15 sq. ft. Tackboard: 15 sq. ft.
Furniture & Equipment: $6,000.00 to $10,000.00

a. The size of the shop and the allowance for equipment allows for senior work to the point where real service work may be undertaken.

b. Provision should be made for the installation of an air hydraulic hoist. Pits and ramps are dangerous and are not recommended. A track and chain fall may also be required. If the structure permits a ceiling in excess of the standard 12 foot height this shop should be favoured.

c. This shop requires a grade entrance with an overhead door 10 feet wide. It is desirable that an apron be provided immediately outside to accommodate a few cars.

d. It is important that adequate facilities be furnished for cleaning parts. If the cleaning arrangements are such that oil and flammable liquids are discharged into the sewer then it is essential that a satisfactory oil trap be provided.

e. Means of general ventilation should be provided. In addition several independent outlets should be provided to carry exhaust fumes from running engines safely out of the building. Such exhaust outlets should be independent of one another. Manifolding is not satisfactory.

f. An area immediately inside the grade entrance should be graded to a floor drain, to drain off vehicles brought into the shop during inclement weather.

329. SHEET METAL SHOP (Vocational)

Location: Isolated as possible. Adjacent to Welding
Floor Area: 1200 to 1400 sq. ft. Min. 60 sq.ft. per pupil
Floor Surface: Wood Block, Laminated edge grain plank, or equivalent
Washing: Wash Tray for 6 pupils
Convenience Outlets: 4
Power: 1 H.P.
Ventilation: Independent Exhaust
Gas: Required
Light Intensity: 20 to 30 foot-candles
Chalkboard: 30 sq. ft. Tackboard: 15 sq. ft.
Furniture & Equipment: $3,000.00 to $4,000.00

a. This is a particularly noisy shop. It should, if possible, be located in an isolated part of the building. It would be desirable to install acoustic material on the ceiling and walls.

330. WELDING SHOP (Vocational)

Location: Isolated as possible, adjacent to Sheet Metal
Floor Area: 1200 to 1600 sq. ft. Min. 60 sq. ft. per pupil
Floor Surface: Concrete (Hardened)
Washing: Wash Tray for 6 pupils
Convenience Outlets: 4
Power: 50 H.P.
Ventilation: As noted
Gas: Required
Compressed Air: Desirable
Light Intensity: 20 to 30 foot-candles
Chalkboard: 15 sq. ft. Tackboard: 15 sq. ft.
Furniture & Equipment: $5,000.00 to $7,000.00

a. This is a particularly noisy shop. It should, if possible, be located in an isolated part of the building. It would be desirable to install acoustic material on the ceiling and walls.

b. A grade entrance with an overhead door 8 feet wide should be provided. An overhead track with a 1 ton chain fall is desirable immediately inside the door for receiving and shipping purposes.

c. Provision should be made for both acetylene and electric welding. A flue 9" X 9" should be provided for a blacksmith's forge.

d. Ventilation is most important. A complete system should be installed to suit the equipment and so arranged to take fumes immediately away for each work station. This installation may not be included in the building contract, in which case a flue 13½" to 18" should be built into the structure, and a collar left for connection at a later date.

e. Much of the equipment in the way of racks, bins, benches, cubicles, etc., can be built in the school.

f. Manifolding systems for acetylene and oxygen present a hazard and are not recommended.

331. ELECTRIC INSTALLATION SHOP (Vocational)

Location: Adjacent to Electric Laboratory
Floor Area: 1400 to 1800 sq. ft. Min. 70 sq. ft. per pupil
Floor Surface: Wood block, Laminated edge grain plank, or equivalent
Washing: Wash Tray for 6 pupils
Convenience Outlets: 4
Power: 10 H.P.
Gas: Desirable
Light Intensity: 20 to 30 foot-candles
Chalkboard: 30 sq. ft. Tackboard: 15 sq. ft.
Furniture & Equipment: $5,000.00 to $7,000.00

a. If the design of the building affords an opportunity to secure a high ceiling, this shop should be selected. A 14' to 16' ceiling is desirable for the installation of wiring structures.

ELECTRIC INSTALLATION SHOP (Vocational) (Cont'd)

b. Various potentials and frequencies will be required. Equipment in the way of motors, generators, frequency changers, transformers, may be installed within the shop for student use. This class and kind of equipment is not included in the building contract. Neither is it intended as part of the operating system of the school in general.

c. Potentials and frequencies generated in this shop may be made available to the electric and radio laboratories.

332. ELECTRIC LABORATORY (Vocational)

Location: Adjacent to electric installation
Floor Area: 1200 to 1400 sq. ft. Min. 60 sq. ft. per pupil
Floor Surface: Wood block, Laminated edge grain plank, or equivalent
Washing: Wash Tray for 6 pupils
Convenience Outlets: 4
Power: 10 H.P.
Gas: Desirable
Light Intensity: 20 to 30 foot-candles
Chalkboard: 60 sq. ft. Tackboard: 15 sq. ft.
Furniture & Equipment: $6,000.00 to $10,000.00

a. If the school is not large enough to justify this shop then arrangements may be made to include a limited range of laboratory work in the Electric Installation Shop. In this case, the estimate for furniture and equipment for the Electric Installation Shop may be increased by $2000.00 to $3000.00.

b. Various potentials and frequencies will be required. Equipment in the way of motors, generators, frequency changers, transformers, switchboards, may be installed in the laboratory for experimental and test purposes. This class and kind of equipment is not included in the building contract, neither is it intended as part of the operating system of the school in general.

c. Some of the equipment in this shop can be built in the school if a proper selection of motors, generators, transformers, switches, meters, fittings, etc., are purchased as equipment.

d. Potentials and frequencies generated in this shop may be made available to the Electric Installation Shop and the Radio Laboratory.

e. Bench accommodation 36" high with transite tops should be provided for a class of 20 students, swing stools attached to the benches at each work station may be provided.

f. Each work station should be provided with convenience outlets for 110/25, 110/60 and 110 D.C.

333. RADIO LABORATORY (Vocational)

Location: Adjacent to electric Laboratory and Science rooms
Floor Area: 1200 to 1400 sq. ft. Min. 60 sq. ft. per pupil
Floor Surface: Linoleum, Asphalt Tile, Hardwood
Washing: Wash Tray for 6 pupils Convenience Outlets: as noted
Power: 10 H.P. (or 15 H.P. if a transmitter is to be included)
Light Intensity: 20 to 30 foot-candles
Chalkboard: 60 sq. ft. Tackboard: 15 sq. ft.

RADIO LABORATORY (Vocational) (Cont'd)

a. Radio Laboratories may be required in the larger schools. Some provision may be made for a limited range of this work in small schools by setting aside some space in the electric installation shop or in the electric laboratory.

b. The radio laboratory may be served by the potentials and frequencies generated in the electric installation shop or electric labpratory.

c. Bench accommodation 36" high with transite tops should be provided for a class of 20 students. Swing stools attached to the benches at each work station may be provided.

d. Drawers or lockers suitable for the storage of sets under construction are essential. The space under the benches may be used for this purpose.

e. Each work station should be provided with ground and aerial connections. Convenience outlets for 110/25, 110/60 and 110 D.C. should be set up for each work station.

f. Some of the equipment in this shop can be made in the school provided that meters, panels, coils condensers, and essential main units are bought as equipment.

334. WOOD SHOP AND MILL (Vocational)

Location: Grade Level, isolated if possible
Floor Area: 1600 to 2600 sq. ft. Min. 80 sq. ft. per pupil
Floor Surface: Wood block, Laminated edge grain plank, Hardwood
Washing: Slop sink
Convenience Outlets: 4
Power: 20 H.P.
Ventilation: as noted
Gas: Desirable
Light Intensity: 20 to 30 foot-candles
Chalkboard: 15 sq. ft. Tackboard: 15 sq. ft.
Furniture & Equipment: $10,000.00 to $14,000.00

a. The size indicated is sufficient for one combination shop. Additional shops may be set up as wood shops, the mill equipment being used in common. Such additional shops should have a floor area of 1200 to 1400 sq. ft. They may be equipped for approximately $2,000.00 to $3,000.00.

b. The wood shop and mill requires a grade entrance with an overhead door 10 feet wide. Additional wood shops require double doors to the corridor to admit machinery and equipment.

c. Machines should be connected to an exhaust system and floor sweeps provided at strategic points for the removal of waste. The waste may be discharged in the boiler room if the mechanical plant is arranged for this purpose. If a cyclone is installed outside the building, it should be arranged for easy unloading and located so that the noise will not disturb classrooms.

d. If the design of the building affords an opportunity to secure a high ceiling, this shop should be selected. A 14' to 16' ceiling is desirable for the installation of the exhaust system.

WOOD SHOP AND MILL (Vocational) (Cont'd)

e. A small tightly enclosed paint room about 100 sq. ft. is desirable. This room may service a number of wood shops and the pattern shop in which case the area should be increased accordingly. The benches and cabinets in this room should be made of metal.

335. PATTERN MAKING SHOP (Vocational)

Location: Adjacent to Mill room and Wood Shop
Floor Area: 1400 to 1600 sq. ft. Min. 70 sq. ft. per pupil
Floor Surface: Wood Block, Laminated edge grain plank, or Hardwood
Washing: Slop Sink
Convenience Outlets: 4
Power: 10 H.P.
Ventilation: as noted
Gas: required
Compressed Air: Required
Light Intensity: 20 to 30 foot-candles
Chalkboard: 30 sq. ft. Tackboard: 15 sq. ft.
Furniture & Equipment: $6,000.00 to $10,000.00

a. About 20 per cent of the floor area should be concrete for an experimental foundry for testing and proving purposes. The foundry should be equipped with a skeleton equipment for small work complete with a core oven and melting pot to handle white metals. A flue 6" to 9" should be built into the structure.

b. Machines should be connected to an exhaust system which may be connected in to the mill system, Item 334, c. Floor sweeps should be furnished at strategic points.

336. CABINET MAKING SHOP (Vocational)

Location: Adjacent to Mill room
Floor Area: 1400 to 1600 sq. ft. Min. 70 sq. ft. per pupil
Floor Surface: Wood block, Laminated edge grain plank or Hardwood
Washing: slop sink
Convenience Outlets: 4
Power: 15 H.P.
Ventilation: as noted
Gas: Desirable
Compressed Air: Required if spray painting is to be used
Light Intensity: 20 to 30 foot-candles
Chalkboard: 30 sq. ft. Tackboard: 15 sq. ft.
Furniture & Equipment: $5,000.00 to $7,000.00

a. It may be desirable to include upholstery in this subject.

b. Machines should be connected to an exhaust system which may be connected to the mill system, Item 334, c. Floor sweeps should be provided at strategic points.

c. The paint and finishing room mentioned in Item 334, e, may be used. If spray painting is required, it will be necessary to arrange the common paint room for this purpose or provide a special spray paint room.

CABINET MAKING SHOP (Vocational) (Cont'd)

d. The spray paint room should be fire proof and equipped with an automatic self-closing door. All electrical equipment, motors, fans, switches, lighting fixtures, must be vapour proof. Electrically operated clocks, bells or phones should not be installed in this room. The booth should be readily cleaned; sharp internal corners should be avoided. The floor of the booth should be zinc or other inert readily cleaned material. The installation should comply with the requirements of the fire underwriters.

337. PRINT SHOP (Vocational)

Location: Adjacent to shops and if possible to English classrooms.
Floor Area: 1200 to 1600 sq. ft. Min. 60 sq. ft. per pupil
Floor Surface: Wood block, Laminated edge grain plank, or equivalent
Washing: Wash tray for 6 pupils
Gas: Required
Compressed Air: Desirable
Convenience Outlets: 6
Power: 10 H.P.
Light Intensity: 40 to 50 foot-candles
Chalkboard: 15 sq. ft. Tackboard: 30 sq. ft.
Furniture & Equipment: $10,000.00 to $15,000.00

a. This subject is intended to provide for both composition and presswork. The amount shown for equipment will provide for a modest installation. The establishment for complete printing instruction is very costly and would require at least two shops, one for hand and machine composition and the other for pressroom work. In this event the space and amount for equipment would have to be doubled.

b. The establishment of a print shop to suit the convenience of the school would not be considered as a shop offering satisfactory training for entry to the trade.

c. Double doors to the corridor are required to admit machinery and equipment.

338. GYMNASIUM

Location: Removed from classrooms
Floor Area: As noted in Item b.
Floor Surface: As noted in Item d
Ceiling Height: Min. 18 feet, desirable 22 feet
Convenience Outlets: 4
Ventilation: Independent Exhaust
Light Intensity: 20 to 30 foot-candles
Chalkboard: 15 sq. ft. Tackboard: 15 sq. ft.
Furniture & Equipment: $2,000.00 to $3,000.00

a. Gymnasiums should be established in all secondary schools. The accommodation varies according to the size of the school concerned. In schools with a pupil body of less than 1000, it is usually necessary to make dual use of the gymnasium floor for auditorium purposes. The following accommodation is suggested:

GYMNASIUM (Cont'd)

b. 1. Schools up to 300 pupils

One Gymnasium 40' X 60' (Will seat 370 as auditorium)
Stage 12' to 15' deep with forestage 4' deep
Dressing and Shower rooms; one boys', one girls'
Instructor's Office; one desirable (May use teachers' rooms)
Apparatus and Chair storage essential

2. Schools up to 400 pupils

One Gymnasium 45' X 70' (Will seat 480 as auditorium)
Stage; 15' to 20' deep with forestage 4' deep
Dressing and Shower rooms; one boys', one girls'
Instructor's Office; one essential, two desirable
Apparatus and Chair storage, essential

3. Schools up to 800 pupils

Two gymnasiums 45' X 70'
Stage 15' to 20' deep with forestage 4' deep
Instructor's Office, one for each gymnasium
Apparatus and Chair storage essential

4. Schools up to 1200 pupils

Two or three gymnasiums 45' X 70'
If two gymnasiums elected; add a Physical Training room 35'X50'
Dressing and Shower rooms; one for each gymnasium
Instructor's Office, one for each gymnasium
Apparatus storage, essential for gymnasiums

5. Schools over 1200 pupils

Add one Physical Training Room for each 400 additional pupils.

c. Gymnasiums which are to be used for auditoriums should be primarily designed and appointed as gymnasiums. Special attention should be given to the rapid and easy conversion from one purpose to the other. Chair storage is essential. Refer to Item 109, a, for maximum number of loose chairs.

d. It is desirable that the gymnasium be on grade. In the event that the floor is below grade, care should be taken to insure the floor against possibility of dry-rot. The best floor surface for gymnasium activities is 7/8" hardwood (maple preferred). Asphalt tile is an acceptable substitute, particularly if the floor is below grade.

e. Good natural light is essential. It is desirable that there be windows (high up) along at least one of the long walls. Good general ventilation is required. It is important that walls should be free of all projections for a height of 8 feet. All doors should open out. Acoustic treatment of the ceiling may be desirable.

f. It is desirable that provision be made for a reasonable number of spectators to see games, displays, athletic events, etc. Overhanging galleries may be used although they have not proved to be satisfactory. Galleries, if used, should not be flat. Folding bleachers are suitable where double gymnasiums are used.

GYMNASIUM (Cont'd)

g. From a physical training standpoint, separate gymnasiums are desirable. Schools with more than one gymnasium often wish to join two gymnasiums to form a large area for inter-form and inter-school games. This is usually done by placing folding doors between adjacent gymnasiums. The use of such doors should be most carefully considered. Observations would indicate that in some cases such doors, once installed, are seldom used.

h. In large schools, it may not be possible to set up a sufficient number of gymnasiums. Physical training rooms may be established as an alternative. These rooms should be adjacent to the gymnasiums. An area of 35' X 50' with a 12-foot ceiling is satisfactory. Good daylight and ventilation are essential. Such rooms are intended for light exercises rather than strenuous games. Locker rooms, dressing rooms, showers, apparatus stores, etc., are not required.

i. Gymnasiums and Physical Training Rooms should be used to capacity for exercises, apparatus work, organized games, etc. Health Education and other related work is best carried on in adjacent classrooms equipped and appointed for this purpose.

j. An office for the teacher should be provided as in Item b. The following suggestions are made.

Location: Convenient access to gymnasium floor
Floor Area: 100 to 200 sq. ft.
Floor Surface: Same material and on same level as gymnasium
Toilet and Shower: desirable
Convenience Outlets: 2
Tackboard: 15 sq. ft.
Furniture and Equipment: $200.00 to $400.00

k. Adequate space for the storage of gymnasium apparatus is required. Each gymnasium requires 100 to 150 sq. ft. It should be directly accessible to and on the same level as the gymnasium floor. An alcove for this purpose is preferred.

l. When the gymnasium is used for auditorium purposes, it should be located and arranged for convenient and safe means of entry and exit.

The cost of equipment and furnishings for the gymnasium and stage for auditorium purposes can vary widely. For items not usually included in the building contract allow from $6.00 to $12.00 for each person in the audience. Some suggestions for auditorium and stage appointments are shown in Item 354.

m. The use of the gymnasium as a community centre should be encouraged. It would then be desirable that the gymnasium and associated areas be readily isolated from the rest of the school. An independent means of entrance is desirable. The cafeteria should be adjacent to or readily accessible from the gymnasium.

If community centre interests demand larger quarters or appointments and facilities which are not normally required for pupils' use, the expense involved cannot be charged to education. These additional special facilities are likely to be separate toilets, lockers, team rooms, equipment rooms, galleries, entrances, etc., together with larger gymnasium floor area.

339. DRESSING AND SHOWER ROOMS FOR GYMNASIUM

Location: Adjacent to gymnasium concerned
Floor Area: 600 to 800 sq. ft. Min. 15 sq. ft. per pupil
Floor Surface: Tile or terrazzo
Light Intensity: 10 to 15 foot-candles
Ventilation: Independent exhaust
Tackboard: 15 sq. ft.

a. Particular attention should be given to ventilation and sanitary finishes.

b. Girls' and boys' routes to dressing rooms and thence to the gymnasium floor should not cross or converge at any point. Dressing rooms should be accessible from the corridor and the gymnasium floor. It is desirable that they be conveniently accessible to playing field activities. If at all possible dressing and shower rooms should be on the same level as the gymnasium floor. Steps should be avoided; easy ramps with non-skid surfaces may be used to adjust slight differences in elevation.

c. Schools with one gymnasium require two dressing and shower rooms (one for each sex). Schools with more than one gymnasium require one dressing and shower room for each gymnasium. Physical Training rooms do not require dressing or shower rooms.

d. Boys' dressing rooms are generally of the open type. Fixed seats should be of a substantial nature. All equipment should be securely fixed and installed to permit easy cleaning. Provision for hanging clothes may take the form of hooks, bars, racks, etc., or the use of half-length individual lockers may be considered. Elaborate systems involving individual lock protection have not proved to be effective. It is not desirable to furnish individual lockers or baskets for gymnasium clothing for the total number of pupils enrolled. The shower room should be of the "open gang" type with 8 to 10 shower heads for a class of 40.

e. Girls' dressing rooms require special consideration from a privacy point of view. Dressing cubicles may be installed for each pupil in a class. The cubicles should be provided with a seat and suitable hooks or hangers for garments. The cubicles may be arranged in batteries of 6 to 8 with convenient access to a common shower cubicle. Such an arrangement would involve 5 to 7 such batteries with a shower cubicle for each battery. Doors on cubicles are a frequent source of accident while curtains are unsanitary. It is suggested that the cubicles be arranged without resorting to these undesirable features.

An alternative arrangement might take the form of 1 battery of dressing cubicles with a common shower, which would offer privacy for 6 to 8 pupils. The remainder would be accommodated in an open type dressing room with an adjacent shower room (4 to 6 shower heads). The showers should be at shoulder height and divided into 4 to 6 stalls. Provision for hanging garments should be made in the form of hooks, bars, racks, wardrobes, etc. Individual full-length lockers may be considered.

In general open-type dressing rooms and gang showers for girls are not popular. Consideration may be given to this type of accommodation.

340. CADET ROOM

Location: Adjacent to Gymnasium
Floor Area: 150 to 300 sq. ft.
Floor Surface: Concrete or Hardwood
Convenience Outlet: 1
Ventilation: Independent Exhaust
Light Intensity: 10 to 20 foot-candles

Where Cadet Corps are established, it is desirable to provide a room for the storage of uniforms and equipment. Wardrobe or hanger arrangements for uniforms are necessary. Proper ventilation is required. A suitable rack for rifle storage and cupboard or shelf accommodation for technical equipment is desirable.

341. RIFLE RANGE

Location: Convenient to Cadet Room if possible
Floor Area: 750 to 1000 sq. ft.
Convenience Outlet: 1
Ventilation: as noted
Light Intensity: as noted
Chalkboard: 15 sq. ft. Tackboard: 15 sq. ft.

a. Where Cadet Corps are established, it is desirable to provide a Rifle Range.

b. The Range should be laid out with a distance of 60 feet from the muzzle of the rifle to the target. A ceiling height of 8 to 10 feet is desirable at the firing end of the range. The ceiling over the remainder of the range may be 6 feet high. The minimum width should be 8 feet; 12 feet is desirable.

c. Doors should be arranged to the rear of the firing position. Doors in any other location should not be permitted.

d. Adequate provision to carry away fumes is essential.

e. All lights should be controlled from the firing end of the range. General illumination may be from 10 to 20 foot-candles. The light intensity on the target should be at least 50 foot-candles. All lighting fixtures should be protected with suitable deflectors.

f. Walls, floors and ceiling should be of concrete. Openings of any kind forward of the firing position should not be permitted unless they are protected with suitable deflectors.

g. A suitable rack should be provided for the safe storage of rifles. Lock up storage is essential for ammunition.

h. If the building of a range is not feasible, arrangements may be made with other agencies for access to suitable indoor or outdoor ranges. The practice of using gymnasiums, cafeterias, etc., for range purposes presents too many hazards to be considered.

342. HEALTH SERVICES

a. Boards wishing to introduce health services in schools should approach the local Board of Health. Provisions whereby such services may be supplied are set out under appropriate sections of the "Public Health Act."

HEALTH SERVICES (Cont'd)

a. Agreements are required, particularly where payment of special grants is dependent upon the extension of available public health services by Boards of Health to schools.

b. If an agreement is reached with the Board of Health, school authorities should provide suitable space in the school concerned and the necessary fixtures and furniture. Medical and nursing supplies and equipment required for the rendering of these professional services associated with presently recognized school health programmes are usually conceded to be the responsibility of the official health agency, the Board of Health. It is most desirable that health service quarters be set up in a central location preferably adjacent to the general office.

Good natural light and ventilation are most desirable. Convenience outlets are required in all spaces except the washroom. Sanitary finishes without a hospital atmosphere are most desirable. It is suggested that the floor be linoleum or asphalt tile.

c. Small schools may set up a small room for a school nurse. This room should be about 150 square feet. One section should be equipped with a wash hand basin, cupboard, desk, chairs, tables, etc. The other section should be set aside as a rest cubicle and furnished with a proper hospital bed.

d. Larger schools may wish to expand the accommodation mentioned above and include a waiting room, small dressing room with toilet, hand basin and clothes closet and an additional rest cubicle. In this case, the area required would be 300 to 400 sq. ft.

e. Schools wishing to offer full health services, viz., doctor, dentist, and nurse, would have to provide approximately 700 to 800 square feet of space.

It should be divided to provide a common office for the doctor and dentist, and nurse's quarters. Each of these spaces require a hand basin. The common office should be provided with plumbing connections for the dentist chair.

A general waiting room with a washroom including toilet, basin, and clothes cupboard is necessary.

The remaining space should be divided into as many rest cubicles as possible. A 20-foot distance is required for eye-testing.

f. The cost of the furnishings not included in the building contract may run from $600.00 to $800.00 for the full suite as outlined in Item e.

343. VOCATIONAL GUIDANCE

a. Every teacher within a school does a considerable amount of counselling or guidance. The value of this service has grown to the point where it has become desirable to set up facilities for this purpose.

b. In small schools, it may be necessary to conduct this work in the regular classrooms or in other suitable spaces.

VOCATIONAL GUIDANCE (Cont'd)

c. In moderate or larger size schools special provision may be made for a guidance suite consisting of a small waiting room and one or more private counselling offices. The suite should be located near and, if possible, have access to the General school office.

d. Depending upon the number of small counselling offices an amount of $400.00 to $800.00 should be allowed for furnishings and equipment.

344. ADMINISTRATIVE OFFICES

a. The offices should be centrally located with easy access to the main school and to the public.

b. In the small school the office for the principal may be required to provide space for the secretary.

Furnishings and equipment, which should include desks, chairs, typewriter, filing cabinets, and a small safe, may cost from $500.00 to $700.00.

c. In the larger school, the principal should be provided with an office furnished and equipped for efficient administration and to meet students, parents, teachers and public in an appropriate manner. Toilet facilities should be provided.

Furnishings and equipment may cost from $300.00 to $500.00.

A general office should be provided. Its size depends upon the size of the school. There should be access to the principal's office and to the school corridor. It should have a general waiting space separated by a counter. The counter should be provided with suitable shelves and drawers. The waiting space should be furnished with seating, bulletin board, pigeon holes for teachers' mail. The office should be equipped with the necessary typewriters and duplicators, filing cabinets, etc. A suitable vault should be included in the building contract.

The cost of furniture and equipment not included in the building contract varies according to the size of the school. The following allowances are suggested.

1.	For an office with one secretary	$700.00 to $1000.00
2.	For each additional secretary	$200.00 to $300.00

d. In the very large school an assistant principal's office should be provided. It should be accessible from the general office and from the corridor. Furnishings and equipment may cost from $200.00 to $300.00

345. OFFICES FOR HEADS OF DEPARTMENTS

Where Departments within a school become sufficiently large, an office should be provided for the Head of the Department. In Vocational schools an office should be provided for the Shop Director.

348. SUPPLY ROOM

A supply room for dispensing student supplies should be set up in all schools. It should be located at some central point and reasonably convenient to the receiving room. It should be sufficiently large for the proper storage of texts, books, scribblers, papers, etc. In large schools, the supply room should be divided by a counter capped by a grill. The section for student traffic should be readily accessible from the corridor. Two single doors, one for entrance and the other for exit are desirable. Small schools may use a dutch door for service directly to the corridor. Special attention should be given to key and padlock storage. A cash register or cash drawer is necessary. The attendant's quarters should be adequately fitted out with open shelves, racks, bins, etc.

The cost of furniture and equipment not included in the building contract may run from $300.00 to $700.00.

349. STORAGE

a. It is almost impossible to provide sufficient storage space to meet all demands. Storage space is expensive. An adequate amount should be provided, but not for such items which have outlived their usefulness and should be discarded.

b. Storage for classrooms, shops, instructional and administrative areas should be included in the space concerned from a point of view of convenience.

c. Some general storage space is desirable particularly in connection with stages, field stores, caretaking, etc.

d. Basement storage is of little use due to its inconvenience. Such storage might require additional waterproofing, lighting and ventilation which may not be justified for this purpose alone.

350. DARK ROOM

Location: Adjacent to Chemistry Laboratory
Floor Area: 100 to 150 sq. ft.
Floor Surface: Linoleum, Asphalt Tile, Hardwood
Convenience Outlets: 2
Ventilation: Independent Exhaust
Furniture & Equipment: $500.00 to $1,000.00

a. Large schools may require a dark room. It is quite feasible to darken a laboratory preparation room for this purpose.

b. A special dark room should be provided with a work sink with hot and cold running water. A double door to form a light-lock is desirable. Gas should not be installed in school dark rooms. Positive means of opening the door from the inside should be provided which will overcome all possibility of a pupil being locked in.

351. TOILET FIXTURES

a. The general requirements for washrooms and the class and kind of fixtures are indicated in Items #114 and 115.

CAFETERIA (Cont'd)

e. Equipment: Steamtable, urns, water cooler, cash register, Trays, tables, chairs, silver containers, etc.; all of the equipment should be easily cleaned. Tables should resist heat and be free of crevices or traps for food.

Cost: The cost of such equipment can vary greatly depending upon the quality selected. A reasonable estimate would be from $15.00 to $25.00 per pupil (one sitting)

f. China and glassware should not be regarded as capital equipment since their useful life is not likely to be more than two years.

g. In very large schools a staff dining room may be considered. An allowance of 20 sq. ft. per person for the number likely to attend at any one time should be ample.

h. Some advantage may be taken of the cafeteria for other purposes such as small assemblies, projection room, study or examination rooms, etc. It should be noted, however, that the cafeteria staff must have sufficient time before and after meals to keep the cafeteria clean and in good order.

i. The establishment of a cafeteria as outlined will require proper kitchen facilities Item 353. An independent staff capable of handling quantity cooking and serving will be necessary.

j. The small school may have to make considerable modifications. In some cases some use may be made of the Home Economics room for the preparation of food.

k. In schools where the pupils bring some of their food and supplementary service in the way of milk, soup and sandwiches is provided, the seating space might still be required but the steamtable and serving area can be turned over to the preparation of supplementary food. A kitchen as such would not be required. This alternative would result in considerable economy in both space and equipment.

l. If the cafeteria is to be used for community centre purposes some consideration may be given to check rooms, washrooms, and an independent entrance for public use. If such extra accommodation is added or if the equipment is of a class, variety or quantity in excess of that required for pupil use, it cannot be regarded as a legitimate educational charge.

353. KITCHEN

a. If a cafeteria is established as outlined in Item 352 and hot meals are to be prepared, a properly equipped kitchen is necessary.

b. Apart from the necessary utensils and other equipment necessary, the following requirements are suggested.

Area: 30% of cafeteria area
Ceiling Height: As high as possible
Floor and Lower Walls: Quarry Tile, or Terrazzo, coved corners
Windows: Screened

KITCHEN (Cont'd)

b. Light: Abundant daylight if possible, 20 to 30 foot-candles Artificial Light, incandescent preferred, fixtures tightly enclosed, easily cleaned.
Floor Drains: At dishwasher, kettles, etc.
Ventilation: Complete with hoods to carry away steam and cooking odours.
Toilet: For kitchen staff
Showers: For kitchen staff, in very large schools
Steam: For steamtable, kettles, urns
Refrigeration: one walk-in 7' X 9', one reach-in
Dishwasher: Desirable
Cost of equipment: The cost varies depending upon the quality and extent of the equipment. A reasonable estimate may run from $40.00 to $50.00 per pupil for the number provided for at one sitting.

c. It is desirable to provide both gas and electricity for the kitchen where both are available. Provision should be made for an adequate supply of domestic hot water preferably direct from the boiler room. Provision should be made for water softening in areas where the water is excessively hard.

d. A grade entrance is desirable for servicing purposes. Failing this, dumb waiter or elevator service is almost essential.

e. In municipalities where a number of schools propose to set up cafeteria accommodation, big economies can be effected by the establishment of a central kitchen. Food prepared in the central kitchen can be distributed in thermal or "air void" containers. Such containers have a 50 meal capacity and keep food hot for 24 hours.

354. AUDITORIUM

a. While the desirability of a well-appointed auditorium is admitted, economic considerations indicate that it is not until the pupil body reaches approximately 1000 that an auditorium as such is feasible.

b. Schools with smaller pupil bodies should consider the establishment of combination auditorium-gymnasiums, Item 338.

c. Where separate auditoriums are feasible they should be built to seat 50% of the pupil body. The following suggestions are made.

d. Seating Space

Area: Allow 7 sq. ft. per pupil for seating and aisles
Sloping Floor: Linoleum or Asphalt Tile
Seats: Fixed
Galleries: Not desirable, but if used, exits at opposite sides
Entrance: Convenient to pupil body, sufficiently large to handle pupil congestion, two ways of corridor approach to entrance in large schools
Exits: Adequate and clearly marked
Darkening: Readily darkened with draw curtains or shades

AUDITORIUM (Cont'd)

d. Seating Space (Cont'd)

House Lights: Switches at entrance, unless panel box on stage can be reached by lighted passage.
Projector: A booth or place for a portable projector. A speaker cable from projector location to stage. One or two intermediate outlets are sometimes provided.
Vision: Good sight lines or unobstructed vision from any part of the house
Audition: Good audition from any part of the house demands proper acoustic treatment. If the space below or above is used, sound insulation may be required.
Heat and Ventilation: Should be adequate and should be controlled independently of other areas.

e. Stage & Back Stage

Forestage: About 4 feet deep is desirable for speakers and vocalists. Steps either side are desirable for uninterrupted view of pupils called to stage from audience.
Proscenium Arch: At least $\frac{1}{2}$ width of auditorium, 10 to 16 feet high. Height should not exceed $\frac{3}{4}$ of width.
Stage: 3'-4" to 4'-0" high, 20 to 25 feet deep. Floor should be pine, forestage may be hardwood.
Wings: Unobstructed, full width of house, wing galleries 6 feet wide may be desirable
Exits: One each side, one may be a scenery door 8' X 8' to school corridor
Hatch: In roof with fusible link
Controls: All house and stage lights
Cable: To projector include sound
Electrical: Complete gear, spots, floods, dimmers, signals, etc. Footlights may be considered although they are not satisfactory for school purposes. Some other provision for compensating low lighting from the house should be made.

f. Dressing rooms, Washrooms, Preparation & Rehearsal Space

It is suggested that access from backstage to the school corridor be arranged so that classrooms, and other spaces may become available for rehearsals, dressing rooms, washrooms, and the preparation of sets, etc., in shops, art and other Departments.

g. Storage

Convenient storage should be provided for the storage of sets, costumes, etc.

h. Cost

The cost of equipment and furnishings for the auditorium and stage can vary widely. For items not usually included in the building contract allow from $10.00 to $20.00 for each person in the audience.

AUDITORIUM (Cont'd)

i. Community Centre

Every effort should be made to encourage the use of the school for educational, social and recreational activities. Reasonable but not excessive amounts might be expended. There is no good reason to compete with reputable commercial interests. Much of the value of a community centre would be lost if it assumed a professional rather than an amateur atmosphere. If community centre interests demand that some further accommodation be added it may be in order to enlarge the auditorium and improve the appointments. The school, however, cannot bear the additional expense involved. Additional features which may be required are suggested as follows.

Separate means of entrance
Adequate lobby or foyer
Ticket Booth
Manager's Office
Washrooms - Men's and Women's
Cloak or check rooms
Telephone Booth (pay)
Increased space for scenery, costumes, workshop
Lock up storage for special community effects
Convenient access to cafeteria

j. Should there be a demand for 35 mm projection, it is well to remember that a special booth designed in accordance with the requirements of the "Theatres and Cinematographs Act" and the services of a licensed operator would be required.

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